

DEBRIEFING REPORT

(RCS-CSFOR-74)

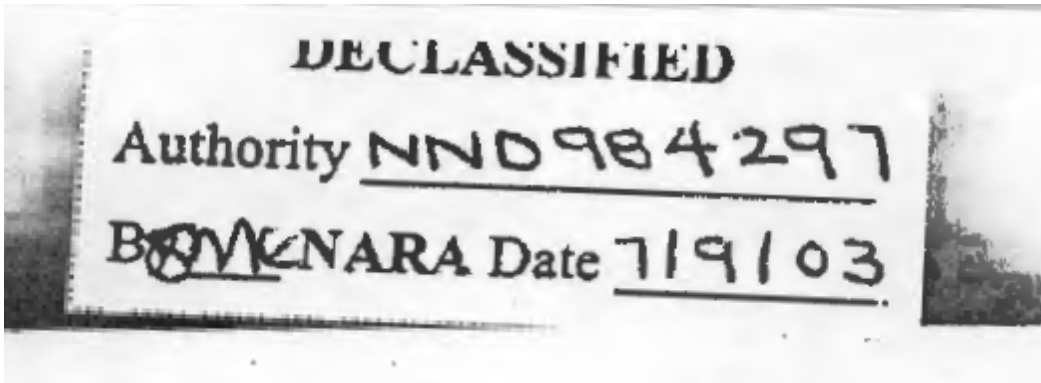
COUNTRY: Republic of Vietnam

DEBRIEFING REPORT BY: BG Glenn J. Collins, MC

DUTY ASSIGNMENT: CG, 44th Medical Brigade/
Surgeon, US Army, Vietnam

INCLUSIVE DATES: 11 July 1967 - 1 August 1968

DATE OF REPORT: 1 August 1968



DEPARTMENT OF THE ARMY
HEADQUARTERS, 44TH MEDICAL BRIGADE
APO San Francisco 96384

AVBJ CG
SUBJECT: Senior Officer Debriefing Report

1 August 1968

Commanding General
United States Army, Vietnam
APO 96375

1. Reference letter, HQ USARV, File AVHAG-PO, subject as above, dated 15 June 1968.
2. Inclosed are five copies of the debriefing report submitted in accordance with para 1 of the above reference.
3. In addition to the information contained in the debriefing report, I believe it appropriate to submit certain overall comments in subsequent paragraphs. Some of the information is covered in detail in the report while other comments are included hereinafter because of their general nature.
4. There is nothing wrong with current Army Medical Service doctrine. Minor variations in methods of operation are sometimes required to suit the local time and place. I have found no justification, during my tour of duty, to change the basic teaching at the Medical Field Service School. I do recommend that more teaching emphasis be placed on the techniques of providing medical support of stability operations in an environment such as Vietnam.
5. Army level air ambulance service has been, together with medical radio regulating, the life blood of our medical support system in Vietnam. Too many of our Army Medical Service officers lack adequate insight into the real value of the radio and are reluctant to use it. The basic and career courses must place increased emphasis on its use. I cannot visualize any future environment in which a separate medical radio net will not be required. The Army Medical Service cannot depend on competing for Signal Corps service. It is axiomatic that when our patient loads are highest (and regulating by surgical backlog is most urgently needed) operational radio traffic is also the heaviest. Experience has shown that without the capability to make radio contact the regulating of patients deteriorates to the detriment of our patients!
6. Air ambulances are absolutely essential for providing medical support in Vietnam. Without "Dust Off" and their courageous and dedicated crews,

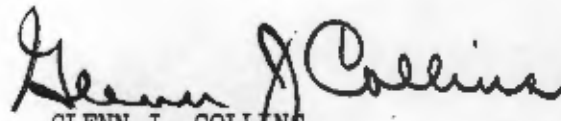
we simply would not be able to evacuate the sick and wounded soldier to our medical treatment facilities. There have been pressures to attach helicopter units of the medical brigade to combat divisions, but, until the day of "helicopter plenty" finally arrives, the aeromedical doctrine presently used by the brigade must be defended. With limited assets, the most effective and responsive utilization of helicopter ambulances can only be achieved by centralized control at the medical group level; with employment in a direct support - general support mode. It is agreed that air ambulances would be useful when organic to divisions. It has, however, been proven month in and month out in the only division having organic air ambulances (the 1st Air Cavalry Division) that the number of patients transported per machine/month compares most unfavorably with the performance data of brigade machines. The attachment of helicopters to divisions would reduce flexibility and prevent the concentration of available assets where and when needed. It should be considered only if unlimited numbers of helicopters become available.

7. Although we have had some problems with the MUST [Medical Unit, Self-contained, Transportable] hospital, it is certainly an improvement over the tent hospitals of the past. It provides an environment for patient care that is comparable to a fixed installation. Without doubt this hospital greatly improves our patient care capabilities in the field. We were most fortunate to have two MUST hospitals available to move to the I CTZ [Corps Tactical Zone] in February - March 1968 to support Army combat units deployed to that area. Within a very short time we had two fine surgical hospitals in operation. This would not have been possible without the MUST equipment. This use is a realization of the real purpose for which the MUST was designed and developed. It was never intended to take the place of a semifixed installation. In those situations it would be more economical and practical to use a more permanent type facility such as quonset huts.

8. A continuing effort has been made throughout the year to improve the medical supply support system and much progress has been made. Overall management of the medical supply function was transferred from the ACofS, G4 to the Surgeon during August 1967. Hospital supply practices have been closely supervised, and adequate supply levels have been established. A significant amount of technical medical equipment has been procured and distributed to the hospitals, dental clinics and the medical laboratory. The depot has been expanded to include six different locations from Phu Bai in the north to Long Binh in the south. Action has been taken to increase the authorized strength from 218 to 351, an increase of 61%. Optical and maintenance shops are now established at the base depot and all advance platoons. Virtually all single vision spectacles are now fabricated in RVN. During the past year, approximately \$30 million of medical materiel has been issued to Army, Navy and Free World Military Assistance Forces in RVN. Initial stockage for units and the advance supply platoon deployed to I CTZ was successfully achieved by the direct shipment of supply packs from the US Army Medical Depot Activity, Ryukyu Islands. Even though the demand for medical materiel has significantly increased during

the last six months, the percentage of fill for all hospitals in RVN has ranged from 83% to 88%. This is a noteworthy increase from the 74% fill experienced during September 1967. Thus, the medical supply support mission has been accomplished in an effective manner.

9. The opportunity to serve in the dual role of Commanding General, 44th Medical Brigade, and Surgeon, USARV has been a most interesting and rewarding personal experience. Because of the "two hatting" and the close geographic proximity of the two headquarters, economies in staffing have been achieved by also "two hatting" the Dental Surgeon, Chief Nurse, Veterinary Officer, Preventive Medicine Officer and the Dietitian. More effective and efficient use of the professional consultants on the USARV Surgeon's staff has been possible by giving them direct access to the medical treatment facilities of the brigade. In general, the brigade staff are the operators and the Surgeon's staff are the advisors and long-range planners. The dual role increases flexibility and responsiveness. There is little time lost between the announcement and implementation of medical policies at the Army level. There are some who advocate complete integration of the two staffs. However, I am personally convinced that this would be a mistake. The USARV Surgeon is responsible for the technical supervision of the medical service of all of USARV. If the two staffs were completely integrated, there is a possibility of becoming so involved in medical brigade activities that the medical service of the divisions, separate brigades, and other units might not receive the attention they require.



GLENN J. COLLINS
Brigadier General, MC
Commanding

1 Incl

1. Debriefing Report

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ANNEX A

INTRODUCTION

1. **GENERAL MILITARY SITUATION.** The US Army in Vietnam is supporting the Republic of Vietnam Armed Forces in their efforts toward pacification and revolutionary development. The primary effort of US Forces has been aimed at defeating and destroying the North Vietnamese and Main Force units in their areas of operation so that Republic of Vietnam programs can be continued and a viable government and economy can be established. US units accomplish their missions in a variety of ways but most frequently they move reinforced company-, battalion- or brigade- size forces into suspected hostile areas and conduct reconnaissance-in-force operations. They may be moved in by air assault or by ground insertion. Many operations are conducted by infantry supported by artillery, armed helicopters and tactical air. Others involve combinations of infantry, armor, engineer, artillery and air cavalry units. Each task force is tailored for its mission. When a mission is completed the units move to other areas to perform other missions with possibly different task organizations. The units periodically return to their base camps for refitting and recuperation. Normal rotation policies, R&R programs, and infusion programs are carried on as units continue their operations. There is a heavy emphasis on aerial resupply and evacuation from forward areas but the bulk of the resupply tonnage continues to move over the land lines of communication. Resupply convoys require additional protection on most routes since they are subject to interdiction.

2. GENERAL MEDICAL SITUATION

a. Medical support has in general conformed to basic doctrine. Because of stability of the larger base camps, mobility of the Army level hospitals is not usually necessary. An exception was the movement in February 1968 of two mobile surgical hospitals (MUST) to the I Corps Tactical Zone to support Army tactical operations in that area. The key to medical support is the extensive use of helicopter and fixed wing aircraft to rapidly move patients to the nearest and most appropriate medical facility. By moving the helicopters from their former positions with hospitals to a position far forward with the supported combat units, the interval between the time the soldier is wounded and time of his arrival at a medical facility has been markedly reduced. Because of the speed of evacuation by medical helicopters, a number of seriously wounded soldiers who formerly would not have survived now reach hospitals alive. It is paradoxical that some of them would not have survived in any case and now count against medical survival rates because they die in hospitals. Nonetheless, never before in history has a wounded soldier had such a high chance of survival.

b. The 44th Medical Brigade became operational 1 May 1966 and is the command headquarters for Army level medical units. All evacuation and treatment units are subordinate to Medical Groups, which are assigned areas of responsibility approximately equivalent to an Army Corps Zone. In his assigned area the group commander provides 1st echelon medical care for nondivisional and nonaviation units, and evacuation and second echelon medical

treatment for all US Army, as well as certain other allied forces. Medical regulating within his zone is controlled from group headquarters. In three of the four groups a separate medical battalion headquarters is used as the command element for ground ambulance, clearing, and dispensary type units. Hospitals of all types plus air ambulance units are kept directly under group command. Special TOE 8-500 teams are attached to the units with which they are functioning. Because of distances, problems of communications, and impediments to easy travel, the single convalescent center normal to a Field Army is assigned to the medical group in close geographic proximity rather than being retained with other general support type units directly under the brigade. The remaining general support units are assigned directly to the brigade.

3. ASSIGNMENT OF 44TH MEDICAL BRIGADE TO US ARMY, VIETNAM

a. On arrival in Vietnam in early 1966 the 44th Medical Brigade was assigned to the 1st Logistical Command. On 10 August 1967 the brigade was relieved from this assignment and assigned to US Army, Vietnam. Concurrently, the Surgeon of USARV was assigned to the brigade as Commanding General. This action culminated the efforts of about a year and a half to place the medical brigade in its most effective organizational location. Among the more important advantages of having the brigade at Army level are the following: (1) CG, 44th Medical Brigade/USARV Surgeon has technical control of all US Army medical resources, and commands all Army level medical units except medical detachments organic to aviation units and a few other separate groups and battalions. (2) Enhances efficiency of medical service by the elimination of an intermediate headquarters. (3) Improves utilization of all available medical resources by vesting technical control/command in the senior medical officer. (4) Improves responsiveness and flexibility in meeting all demands for medical support. (5) Reduces delays in medical planning, medical statistical reporting, and the implementation of professional consultants' recommendations. (6) Enhances the management of medical personnel in order to meet changing requirements.

b. The best organization for command/control of Army level medical support is that which provides maximum flexibility with greatest economy. During the past year experience has shown without question that the current medical brigade organization meets those criteria. Utilizing complete vertical control and providing service which is area oriented, the brigade actually is a closely integrated, if geographically dispersed, medical center. The facilities of the system, although up to hundreds of miles apart, are linked by radio, and tied together with rotary and fixed wing aircraft. Each separate geographic area is not required to be staffed or equipped for every contingency since the entire system can support any area or combination of areas, thus achieving overall economy. It must be concluded that any segmentation of control would reduce the flexibility of the system, and increase requirements for medical support in each area. With regard to assignment of the brigade itself, the same general principle applies, i.e. control should be uninterrupted, as it is in USARV, with the 44th Medical Brigade directly under Army headquarters. Another direct dividend accrues since additional economics in consultant staffing are possible in such an arrangement by having consultants serve both headquarters.

ANNEX B

MILITARY ASSISTANCE

1. MEDICAL CIVIC ACTION PROGRAM (MEDCAP)

a. This program, designed to support Revolutionary Development activities, until 1 July 1967 had been dependent on the RVNAF medical depot system for medical supply support. In most instances this required considerable travel and was time-consuming which served to limit the number of MEDCAP activities accomplished. Beginning in July 1967, units were permitted to draw the required supplies through regular US supply channels and were given increased supply levels to accommodate programmed MEDCAP projects. This resulted in an increase in both number and scope of projects. The program has effectively carried modern medicine, dentistry, and veterinary medicine to practically every village and hamlet country-wide, and has contributed greatly to the achievement of US objectives in Vietnam. In the medical field, activities have varied from simple sick call treatments to highly complicated surgical procedures. The bulk of dental treatments have been tooth extractions and treatment of soft tissue infections. Veterinary activities included immunization of animals in civilian communities for control of rabies and the treatment of farm animals (cattle, water buffalo, and hogs) for various diseases found in Vietnam.

b. For the period 1 December 1967 to 31 March 1968, an average of 188,441 patients received outpatient treatment each month. In addition, a monthly average of 17,686 were immunized and 968 were hospitalized in US Army facilities. Approximately 15,000 dental treatments were given each month. During 1967, a total of 21,391 animals in civilian communities were immunized against rabies and 2,254 farm animals were treated for various diseases.

2. CIVILIAN WAR CASUALTY PROGRAM

a. Conceptual development of the Civilian War Casualty (CWC) Program was accomplished by medical representatives of USAID. The proposal was presented to, and approved by, the heads of both the United States and Republic of Vietnam Governments. Experience had shown that civilians with war-related injuries requiring hospitalization were being generated at a rate of 45,000 to 50,000 a year. The provincial hospital system of RVN was capable of treating approximately 25,000 of these and the proposed program was to offset the existing disparity between the casualty load and the hospital system. Once approved, the US Department of Defense was assigned responsibility for planning and implementing a project which would satisfy the program objectives. Responsibility for detailed planning was assigned to COMUSMACV who was also to act as the in-country program coordinator.

b. The MACV plan considered a potential workload of 25,000 patients a year. As a guide it was estimated that the average hospital stay would be 14 days. This would permit the accomplishment of necessary surgery and a

short period of recovery. The patient would then be returned to the provincial hospital for a period of convalescence. Based on this concept it was determined that 1,400 hospital beds would be needed. The plan considered both casualty density and availability of Vietnamese medical resources. Of the 1,400 beds, 700 were planned for construction in the northern provinces of RVN, 400 at Da Nang, and 300 at Chu Lai. A third hospital of 400 beds was to be sited at Can Tho in the Mekong Delta region. The remaining 300 beds were to be made available from existing USARV hospitals, 100 at Vung Tau and 200 at Tuy Hoa.

c. USARV was assigned the mission of operating the medical facilities in support of the program. To accomplish this mission, two 400 bed evacuation hospitals and one surgical hospital augmented by a medical clearing company (300 beds) were added to the USARV medical troop list. A group headquarters, two air ambulance detachments, and a supply detachment were also added.

d. Planning envisioned that resources to accomplish the program were to be made available to MACV. However, guidance accompanying the approval of the plan by the Secretary of Defense required that the project be supported within MACV personnel ceilings with funds obtained by MACV reprogramming action, with a reimbursement of funds promised at a later date. Funding was accomplished by USARV and the command also provided the 1,164 military spaces required for the program. This was cause for consternation on the part of all involved with the program. Several steps which would assist in minimizing the impact of this decision were considered. It appeared that integration of the program into the USARV hospital system and the joint utilization of all facilities was the most economical approach. This step would produce sizeable financial savings while reducing the overall hospital requirements by one 400-bed evacuation hospital. This plan was proposed to DOD prior to the beginning of the construction of the hospitals but was denied. Many problems were encountered in securing real estate for the hospitals at Da Nang and Can Tho. In late December all the problems of siting of the hospitals were resolved and contracts were let for the construction to begin in early 1968. In April 1968, while the construction was in progress, DOD approved the concept of joint occupancy. As a result of this action, additional funds were made available to upgrade the hospitals so they could be used for military as well as civilian patients. The upgrading involved electrical wiring, more air conditioning, and more space for clinics. The originally planned construction was completed on the three hospitals in June 1968 and the facilities accepted by the using units. Upgrading projects are in progress and can continue until completion without interfering [sic] with the operation of the hospitals. All hospitals are expected to be ready to receive patients during July 1968.

e. Implementation of the program has generated several problems. Patients are reluctant to leave their home provinces for hospitalization. Joint utilization has partially solved this problem, but remnants of it will continue to be evidenced. A second area of concern is the management of family members who accompany the patient to the hospital. Although the plan provides for an escort for the elderly and children, in some instances an entire family arrives with the patient. In the Vietnamese hospitals

this is acceptable, and the family serves a useful purpose by providing nursing care to the patient. The concept is not compatible with US methods, and every effort is made to hold these “boarders” to the absolute minimum. Disposition of remains of those patients who die in a US hospital is an unresolved problem area. When a next of kin is identifiable and will accept the remains, the matter is resolved. In many cases this is not possible, and disposition then becomes extremely troublesome. Although the plan calls for these remains to be retrograded to the provincial hospital of origin, no mention was made of intermediate handling. Graves registration facilities admittedly are not staffed to accomplish this mission; however, that is the logical agency for providing the service, and attempts are now underway to resolve the controversial areas relating to this matter.

ANNEX C

PERSONNEL

1. AMEDS OFFICER POSTURE During the period 1 July 1967 to 30 June 1968 the AMEDS authorized strength increased by 24% as follows:

<u>CORPS</u>	<u>1 JULY 67</u>	<u>30 JUNE 68</u>
ANC	638	843
DC	225	278
MC	932	1,231
MSC	597	760
AMSC	0	1
VC	25	60
<hr/>		
TOTAL	2,417	3,173

The major contribution to the increase was due primarily to the addition of two evacuation hospitals, two surgical hospitals and four infantry brigades. There was a shortage of 10 to 15 percent in Medical Corps officers during the period. This was mainly in MOS 3100 (It was necessary to substitute MOS D3129 and MOSs C3108 and D3108 for 3100 positions.). A high percentage of medical officers were board certified or board qualified in general surgery and orthopedics. The outstanding performance of these officers compensated for the numerical deficiencies in related specialties. There were no other significant shortages during the period.

2. TIMELINESS OF REPLACEMENTS. Timeliness of replacements is most desirable for any organization. It is imperative that this occur in the case of senior key command and staff positions. Too often these replacement officers are scheduled to arrive after the incumbent has departed on his normal DEROS. The necessity to provide timely replacements must be emphasized. This command does not have adequate in-country resources to cover these key positions in an adequate manner. Further, experience has shown that the replacement officer makes a smoother adjustment and transition to his duties when an overlap of 3 to 7 days is provided. Increased emphasis by assignment personnel is required in order to achieve this desirable objective.

3. STATUS OF ENLISTED PERSONNEL. During the first three months of this period there was a shortage of AMEDS enlisted personnel. By the end of October 1967 actual strength began to balance authorizations although a critical shortage in certain specialties continued to exist until early March 1968. Since March, the command has been overstrength in AMEDS enlisted personnel with no significant shortage in any MOS. At present the overstrength status is phasing down to bring the actual strength closer to the authorized level.

4. THE NEW SURGEON. Few newly assigned surgeons have prior experience treating war wounds. To properly treat these wounds, the surgical

techniques are learned in the operating room. Didactic lectures and reading the writings of predecessors are only an introduction. Regardless of his previous training, an incoming surgeon is assigned to a surgical team with an experienced surgeon who is his personal tutor and who supervises his work until he has mastered the techniques of combat surgery. Despite frequent changes in the surgical staff, this instructional program maintains a high quality of professional care; furthermore, it is the means of passing on advances in techniques even before they reach current literature.

5. THE NEW UNIT. The staffs of incoming major units such as surgical hospitals or evacuation hospitals are tailored. A new staff is organized using as a nucleus personnel who have had several months' experience with mass casualty situations, difficult surgical problems and medical regulating. This precludes the "new unit syndrome" in which their presence is soon felt at successive echelons as patients appear who have not had the same quality of care as those coming from experienced units. The infusion program of old and new "blood" also adjusts the DEROS hump of the unit, thus a smooth high quality of performance is maintained.

6. ROTATION OF MEDICAL CORPS OFFICERS

a. In an effort to provide some diversification of duty and offer a stimulating professional experience to general medical officers and partially trained specialists a rotational policy has been in effect for this entire period. Basically such officers are initially assigned to a combat unit upon arrival in USARV. Upon completion of five months' duty they may request reassignment to a unit of the 44th Medical Brigade. The combat units generally approve these applications with the proviso that a replacement must be received prior to departure of the incumbent.

b. A suspense file, in priority order based on the in-country arrival date of the applicant, is maintained in the Personnel Division, Office of the USARV Surgeon. As new input is received, these individuals are moved into the combat units and the highest priority applicant is then moved into a 44th Medical Brigade unit. This move will generally be made between the sixth and tenth month.

c. Additionally, in some cases general medical officers and some "D11" grade specialists are assigned initially to a 44th Medical Brigade unit. Each of these individuals, upon completion of six months' duty in such a unit, is available for direct exchange of assignment with an individual of commensurate qualifications in a combat unit.

d. All medical officers involved in this program are briefed on the program upon arrival in the command. They also are informed that an exchange is not to be considered a certainty in all cases. Since by far the greater number of physicians in this category are assigned to combat units it simply is not possible to accommodate all requests for rotation from combat units.

ANNEX D OPERATIONS

1. **MEDICAL PLANNING FACTORS.** The most restrictive local factor influencing planning of the medical support system has always been, and still is, the availability of reasonably secure real estate upon which to site treatment facilities or from which evacuation units can operate. The second pervasive factor is the dearth of secure land routes and the requirement to live and operate by air. The third overall consideration, which does help to solve the problems imposed by the first two, is the complete absence of enemy air which allows high density occupation of secured areas and relatively free use of our air vehicles. The real threat of mortar or rocket attack exists nearly everywhere, but is not the major consideration that the probability of air attack would be as far as medical service operations are concerned.

2. FIXED INSTALLATIONS VS TOE

a. The bulk of US Army hospitals have been established in fixed facilities. Exceptions to this are the surgical hospitals established in MUST equipment. Also, the 95th Evacuation Hospital, when it arrived in Da Nang in late April 1968, was established temporarily in wooden framed tents supplemented by two temporary tropical buildings, three expandable operating rooms (MUST) and two inflatable shelters (MUST). The 95th Evacuation Hospital moved into a 400- bed quonset facility in July 1968. Shelters for the hospitals are tropicalized wooden buildings, quonsets, specially designed semi-permanent structures or a combination thereof. Even in the case of the first two MUST surgical hospitals, buildings were provided for billeting, mess, supply, et cetera. The hospitals are equipped with the latest in sophisticated medical equipment, excess TOE equipment has been turned in, and for all intents and purposes the facilities have become "Field," "Evac," and "Surg" hospitals in name only. They more closely resemble a modern CONUS Post Hospital complete with air conditioned pre-op, operating, and post-op areas. This was a normal development of the nature of the conflict. Hospitals were sited in available secure areas, or base camps, and hence evolved into fixed facility type installations to meet the requirement for the best possible patient care. They were located at bases from which major troop concentrations could be served, with the philosophy that in the absence of safe land lines, and in the presence of available air ambulances, the patient would be brought to the hospital rather than trying to take the hospital to the patient. During the buildup, it was possible to select sites so that any patient in an active operational area would be within thirty minutes' flying time of a major treatment facility.

b. By the end of this report period ten 400-bed evacuation hospitals, two 400-bed field hospitals, one 100-bed field hospital, six 60-bed surgical hospitals and one surgical hospital augmented to a capacity of 300 beds by one clearing company were established in Vietnam. This provides a total of 5,560 beds. In addition, 1,300 convalescent beds were available at the 6th Convalescent Center at Cam Ranh Bay.

3. MOBILITY OF MEDICAL UNITS. Medical units organic to divisions, separate brigades, artillery and engineer units, have retained their mobility. Although many are operating in tropical buildings, quonset huts, and framed tents, they have retained their TOE equipment authorized for displacement. Army level ambulance and clearing companies have retained their mobility. However, the bulk of the hospitals have turned in the TOE equipment not required in their present semipermanent situation and are relatively immobile. Exceptions are the 18th and 22d Surgical Hospitals equipped with MUST equipment. Also, the 29th and 95th Evacuation Hospitals have retained all their TOE equipment and will remain capable of becoming mobile. It is considered that at least this number of hospitals should be available to react to tactical requirements.

4. PASSIVE DEFENSE AND PROTECTION OF MEDICAL INSTALLATIONS

a. Medical treatment facilities have no immunity to enemy attacks. It is essential that bunkers, sandbags and all practical passive measures be emplaced and maintained. Many medical personnel and patients owe their lives to proper sandbagging of hospitals and other treatment facilities. Several hospitals have been hit by mortars and/or rockets. The 3d Surgical Hospital (MUST) at Dong Tam has been attacked by mortars on numerous occasions. The first attack was in July 1967 when practically all inflatable shelters for patients were hit and knocked down, rendering the hospital inoperative for several days. In spite of the frequent attacks on the 3d Surgical Hospital there have been no deaths and no injuries to patients. A few hospital personnel have been injured, but most suffered only minor injuries. In November 1967 the 12th Evacuation Hospital received one mortar round in the vicinity of their mail room which killed a patient who was mailing a letter. Subsequently, it received one other minor attack with only minimal damage and no injuries. In February 1968 the 71st Evacuation Hospital at Pleiku received approximately eight 122mm rocket rounds, damaging four wards, destroying one latrine building, and two quonset supply warehouses. One young Vietnamese male patient who would not stay down on the floor with the other patients was killed. There were a few minor wounds among hospital personnel. In February 1968 the 45th Surgical Hospital (MUST) at Tay Ninh received several rocket rounds in its area. The first round hit in front of the admission tent and a large fragment went through the wall of the inflatable shelter above the area of sandbagging, killing a medical officer who was standing over a patient he was examining. In June 1968 the 8th Field Hospital at Nha Trang received some mortar rounds which damaged a barracks and destroyed two autoclaves in Central Materiel. Minor injuries were sustained by a few hospital personnel.

b. All hospitals have their wards and surgical suites protected against attacks. Most of them have used sandbags or oil drums filled with sand. To be effective the walls should be at least 4 to 5 feet in height and even higher around the surgical suites to allow surgical teams to continue to work during an attack if necessary. Revetments for the 24th and 93d Evacuation Hospitals at Long Binh have been built by the Engineers. They are made of wood and filled with sand and extend around all wards and surgical suites to a height of about 6 to 8 feet. The Engineers have also built a very extensive revetment structure around the 3d Surgical Hospital which

completely incloses [sic] the patient treatment area. Walls and roof are constructed of 14 x 14 inch bridge timbers. The sidewalls are of double thickness and are 3 feet wide at the base, sloping to 2 feet at the top. The space is filled with sand. On top of the solid timber roof an additional layer of sand, 3 feet thick, has been added. Then a peaked sheet metal roof has been placed over the entire structure. It is anticipated that this arrangement can withstand a direct hit by an 82mm mortar.

5. HOSPITAL CONSTRUCTION

a. The majority of our hospitals are housed in quonset huts. Over the past few years the design has been improved, utilizing innovations developed at several of the older facilities. It has been found that a considerable gain in useable floor space is realized if the quonset is built on 40-inch concrete walls. Further, these reduce the requirement for sandbagging for patient protection from mortar and rocket attacks. Another very important improvement is a continuous central corridor connecting all the quonsets. This permits a combat casualty, once he enters the hospital, to remain under cover in a controlled environment during his acute care. He will pass through triage and other areas to the surgical suite and to the postoperative and intensive care units under constant professional contact and observation. The central corridor also permits additional space for storage, physicians' offices, treatment rooms, utility rooms, latrines and showers. All of these improvements have been included in the last three newly constructed hospitals, the so-called Civilian War Casualty Hospitals. In addition, six- to eight- foot revetments have been placed around the surgical suites.

b. "Arctic" quonsets, which have insulation in the walls are considerably more comfortable than the usual variety. In this tropical climate air conditioning of the surgical suite and most wards is a necessity. There is a considerable variation in the amount and quality of air conditioning in USARV hospitals. About 50% of the hospitals have piped water distribution systems of some form. Only about 10-15% presently have waterborne sewage. Funds are programmed to upgrade all of the hospitals to provide air conditioning, piped water and waterborne sewage. It is scheduled to be completed in either FY 69 or FY 70.

6. AUGMENTATION OF SURGICAL HOSPITAL

a. Experience in Vietnam has supported the medical doctrine that at least one evacuation hospital is necessary to support each division. However, attainment of this goal is mitigated by: (1) Diverse location of divisions, (2) Difficulty in obtaining suitable real estate, and (3) Shortage of evacuation hospitals in the troop list.

b. In order to overcome this shortage of evacuation hospital beds, the expedient of augmenting a surgical hospital by attaching a clearing platoon or company has been used. This has increased the holding capability of the surgical hospital, but it fails to add true patient care capability. This is due to failure of the TOE of the clearing company to provide physicians, nurses, and enlisted men in the proper number and/or MOS. At best,

augmentation of a surgical hospital with a clearing company or platoon merely adds a limited convalescent and holding capability. One exception is the 27th Surgical Hospital which has been augmented to a 300-bed capacity by the addition of a clearing company, in which a MTOE was developed which included personnel with the proper MOS.

7. NEED FOR A NEW FIELD ARMY HOSPITAL. Experience in Vietnam has shown that more flexibility is needed in our TOE hospitals for the Field Army. A capability to expand or reduce the bed capacity of hospitals to meet varying troop strengths and tactical situations is needed. Often the 60-bed surgical hospital is too small and the 400-bed evacuation hospital is too large. The use of a clearing platoon or company to augment a surgical hospital is not satisfactory. It is recommended that a study be conducted to determine the feasibility of designing a hospital using the "building block" concept, i.e. a basic element of 50 or 100 beds with the capability of augmentation in increments of 100 beds up to 400 beds. The basic element of 50 or 100 beds could replace the surgical hospital.

8. RADIO COMMUNICATIONS

a. Radio communications are absolutely essential to the efficient conduct of medical regulating and other medical operations in Vietnam. The geographic distribution of medical units over the entire length of Vietnam; the lack of rapid land line communications; and the unreliability of often interdicted road nets have accentuated the requirement for radio communications in order to conduct the requirements for patient, medical materiel, and medical troop movement. Communications over short ranges can be conducted with the organic FM radios, but long-range radio communications between the medical brigade and its subordinate medical groups, as well as the inter-intra group communications, has developed the need for the single side band (SSB), FRC-93 (Collins KWM-2A) transceivers. These radios provide the range needed for radio communications to any point in Vietnam.

b. A special request was forwarded 31 August 1967 requesting that the FRC-93 transceiver be placed on the MTOE for the medical brigade and medical groups. The standardization package for medical units here, which was submitted in the Fall of 1967, included the requirement for these radios.

c. A total of thirty eight radios has been requested for issue to brigade units. Currently there are sixteen radios of this type in the medical units. The additional 22 radios are scheduled for delivery during mid-1968. When these radios arrive the total requested (38) in the MTOE should be on hand. Radios of this type are used also by the Field Medical Regulators.

d. Problems encountered with these radios are breakdowns due to heat and dust. Low voltage input is another common difficulty and will burn out the radio. Even with these problems, this SSB radio is the best known at this time. However, continued study and research is recommended since improved versions of other radios, particularly of the Army family, may become more available.

9. MEDICAL REGULATING

a. Medical regulating in Vietnam is divided into four phases which have become more distinct because of the application of experience factors and the establishment of more definite in-country and out-of-country aeromedical evacuation systems.

b. Phase I involves the evacuation of patients from the site of injury to the nearest tactical division level medical treatment facility. Responsibility for this phase is retained at the division level. "Dust off" supports the division.

c. Phase II overlaps Phase I and includes the evacuation of patients from the site of injury, or the division forward medical treatment facility, to the nearest 44th Medical Brigade treatment facility capable of providing necessary and immediate treatment. Contrary to the classical concept of evacuation, this may be a surgical hospital, field hospital, evacuation hospital or field army level clearing company. Medical groups have the primary responsibility for control of this phase and the primary means of evacuation is usually "Dustoff." To facilitate evacuation and regulating during this phase, it has been advantageous for medical groups to utilize field medical regulators in certain areas of Vietnam. The field medical regulator is located at the division level treatment facility and consists of a representative of the group Medical Regulating Office (MRO). The field medical regulator establishes communications with the group MRO. He is also able to inform the medical group of possible increases in casualty density and estimated arrival times of evacuation flights. This system has worked most effectively in support of the 1st Cavalry Division (Airmobile) in the I Corps Tactical Zone and the 4th Infantry Division in II Corps Tactical Zone, North.

d. Phase III involves movement of patients to in-country treatment facilities to provide further definitive care, in-country convalescence, or an even distribution of patient workloads. Patients in this category usually have an expected length of hospitalization not to exceed 30 days. The initial responsibility for Phase III begins with the medical group MRO as patients are evacuated to hospitals within the group. If evacuation to hospitals of another medical group is required, a request is submitted to the brigade MRO. At this point, the brigade MRO assumes responsibility and distributes patient workload throughout all treatment facilities in Vietnam or to hospitals capable of completing required treatment. The primary means of evacuation is provided by US Air Force fixed wing aircraft operating on routine schedules; however, "Dustoff" does provide some assistance.

e. Phase IV includes evacuation out of country to PACOM or CONUS treatment facilities for extended definitive treatment or convalescence in excess of 30 days. Phase IV is the complete responsibility of the brigade MRO. Hospitals submit a request to respective group MROs, utilizing formats and diagnosis codes established in current regulations. Group MROs consolidate the hospital reports and submit them to the brigade MRO. The brigade MRO consolidates the group reports and submits them to the Far

East Joint Medical Regulating Office (FEJMRO) in Saigon. At that time a destination hospital for each patient is provided. This information is passed through groups to the hospitals; the patient's clinical record is closed out; and he is prepared for movement to a Casualty Staging Facility (CSF) and subsequent evacuation out of country. CSFs are operated by the 7th US Air Force. A 36- to 48- hour time frame is established for processing of routine out-of-country evacuation requests to provide hospitals with necessary time for preparation of clinical records and to allow patients to be moved to casualty staging facilities one day prior to the scheduled flight. However, urgent evacuation requests can be processed within an hour, depending on the availability of aircraft.

f. During relatively calm periods hospital commanders cannot allow the hospital census to build up unnecessarily. An unforeseen mass casualty situation can quickly fill every available bed and it becomes a difficult task to begin transferring patients who should have been previously evacuated when most professional personnel are busy caring for incoming casualties.

g. During these calm periods medical regulating must be based primarily on beds available. However, during mass casualty situations this aspect becomes less important and surgical backlogs become the influencing factor. Patients must be evacuated to treatment facilities capable of providing required treatment.

h. Establishment of scheduled fixed wing flights is most important. In early 1968 there were a minimum number of in-country and out-of-country flights available which somewhat limited evacuation and created the requirement for numerous nonscheduled "special" flights. Shortly after the Tet offensive, the number of out-of-country flights was increased and in-country flights were correspondingly increased. This increase in flights provides much more adequate coverage throughout Vietnam, decreases the need for "special" flights, and allows almost continuous evacuation. The following are the established in-country and out-of-country schedules for aeromedical evacuation:

IN-COUNTRY AEROMEDICAL EVACUATION SYSTEM

<u>MISSION #</u>	<u>AIRCRAFT</u>	<u>LOCATIONS SERVED *</u>	<u>FREQUENCY</u>
265	C118	Tan Son Nhut, Pleiku, Qui Nhon Tuy Hoa, Nha Trang, Cam Ranh Bay	4 Flights/week
260	C118	Chu Lai, Da Nang, Qui Nhon, Tuy Hoa, Nha Trang, Cam Ranh Bay	4 Flights/week
360	C130	Quang Tri, Phu Bai, Da Nang, Qui Nohn, Nha Trang, Tuy Hoa, Cam Ranh Bay	Daily
877	C130	Tan Son Nhut, Bien Hoa, Cu Chi, Vung Tau, Cam Ranh Bay	Daily

*Flights may overfly locations if evacuation requirements do not exist. Route of flight is determined by number of patients to be evacuated and required stops.

OUT-OF-COUNTRY AEROMEDICAL EVACUATION SYSTEM

<u>ORIGINATING LOCATION</u>	<u>AIRCRAFT</u>	<u>DESTINATION</u>	<u>FREQUENCY</u>
Da Nang	C141	Yokota, Japan and CONUS	Daily
Da Nang	C141	Clark AFB and Guam	3 Flights/week
Tan Son Nhut	C141	Yokota, Japan and CONUS	Daily
Cam Ranh Bay	C141	Yokota, Japan and CONUS	5 Flights/week
Tan Son Nhut	C118	Clark AFB via Cam Ranh Bay	3 Flights/week

NOTE: All flights scheduled to Japan continue to either Travis Air Force Base or Andrews Air Force Base for evacuation of CONUS-regulated patients.

i. A reliable communications system is required for efficient and timely medical regulating. The single side band radio system, which provides communications from field medical regulators to group MROs and from the medical group to the brigade MRO, has been extremely beneficial and must be a part of any medical regulating system established in a combat zone. Effective communications are especially important during mass casualty situations when information concerning evacuation flights, surgical backlogs and beds available is urgently needed.

10. Helicopter Ambulance Operations (“DUST OFF”)

a. Aeromedical evacuation units, known to everyone as “Dust Off,” are the basic ingredient for success in the 44th Medical Brigade medical support effort. Without air vehicles under medical control to evacuate or transfer patients, and to deliver emergency medical supplies and blood, effective medical support in this environment would be impossible. Air ambulances are employed in the doctrinal direct, general, and area support roles. Tactical operations and the location of secure bases determine largely the type of aeromedical evacuation support. Deployed tactical elements receive direct support from air ambulance platoons, detachments, sections, or individual aircraft field sited in close proximity to or in the area of operations. Air ambulances not committed to the direct or general support role are available to provide support to nondivisional units on an area basis. Each medical group in the brigade is assigned an air ambulance company and/or detachments in accordance with the requirement imposed by the size of the respective area of responsibility, and combat elements to be supported. In this theater, medical detachments (RA) have proven more useful and versatile than medical companies (AA). Although the detachments have the same number of machines as the platoons of air ambulance companies, they are better organized and better equipped for independent action. This is particularly true in regard to maintenance capability.

b. In August 1967 the brigade had 4 helicopter ambulance detachments (6 machines each) and one air ambulance company (25 machines) for a total of 49 authorized aircraft. At that time float aircraft were rarely available. With these austere resources, coverage of tactical operations was

extremely difficult. With the arrival of an additional air ambulance company in August 1967 plus 4 more helicopter detachments in the period September to November 1967, in-country assets rose to 98 authorized aircraft which is our present authorization. However, this increased capability was more than offset by the increase in tactical operations to be supported. So the problem of limited resources remained. To cope with it, aggressive effort was directed towards: field siting of a large percentage of available aircraft; improving maintenance support; increasing the number of "float" aircraft; and pursuing a stringent safety program. These separate but complementary endeavors improved our capability to respond where and when needed.

c. The new company and detachments arrived from CONUS equipped with the new UH-1H aircraft. These machines had 1300 horsepower engines while the 49 UH-1D machines we had on hand had only 1100 horsepower. This increased power was welcomed as it improved our capability in hoist operations and in getting in and out of "hot" landing zones and small jungle clearings. Within a few month all of our UH-1D machines were replaced by UH-1H aircraft.

d. Field siting in Vietnam is a necessity. A war characterized by small unit engagements at scattered and often isolated locations dictates that support elements must also be dispersed. Responsiveness cannot be assured by providing conventional area support. Accordingly, field sitings were increased from an average of three locations involving three helicopters to an average of twenty-two locations involving 25 helicopters. Figure 1 portrays typical area coverage by field sitings.

e. Helicopter maintenance is particularly demanding for "Dust Off" units. The machines are in almost constant use and risks of combat damage during hoist operations is at least equal to or exceeding that of nonmedical helicopters. Direct and general support maintenance units have given "Dust Off" units top priority for maintenance. Even with this priority, helicopter maintenance has been a continuing problem. Because of the 24-hour-a-day, seven-day-a-week nature of aeromedical operations, scheduling of maintenance is most difficult. Medical helicopters, by reason of their lifesaving mission, are exposed to and suffer high rates of combat damage. The combination of the two factors results in less than desirable availability rates, yet the machines must be available if the entire medical support system is to operate effectively. Because of the above, and other factors, an aircraft availability goal of 70% is considered acceptable in Vietnam instead of the Department of Army goal of 80%. Even though the statistics in Figure 2 indicate a monthly average availability of aircraft of approximately 70%, it should be understood that averages are sometimes misleading and in this case too comforting. On a given day, especially during the Tet offensive, and frequently since that time, the brigade had less than 60% helicopter availability even with as many as twelve or more "float" aircraft. In spite of enjoying priority by Aviation DSUs, and with the use of "float" aircraft, we have had a constant battle to keep enough aircraft operational to fulfill our mission. It is recommended that 1 KD team (TOE 50 - 500 R) and 1 RL team

(TOE 11 - 500 D) be allocated per Medical Company (AA) or per five Medical detachments (RA) in an operational zone such as RVN. It is believed that this would materially improve the air ambulance operational availability. Precedent for such allocation exists since one KD team and one RL team is allocated per Aviation Company (30 aircraft) in the 1st Aviation Brigade.

f. In an effort to provide even better maintenance support and increase the number of helicopters available for medical evacuation, the 44th Medical Brigade has been assigned 12 "float" UH-1H helicopters on a permanent basis. These, combined with the TOE aircraft, provide a total of 110 helicopters for evacuation purposes. Float aircraft, in addition to the twelve, are provided as necessary to replace aircraft losses due to accidental or combat damage or as temporary replacements for "Dust Off" helicopters involved in extended maintenance.

g. Flying conditions in Vietnam have proven to be a greater threat to the safety of medical aircraft and crew than combat damage resulting from enemy activities. Though some accidents were caused by the failure of pilots to react properly to a critical condition, the most prevalent causes of serious accidents were weather and poor visibility. Although most of the medical pilots are instrument qualified with either a standard Army qualification or a tactical qualification, it is the brigade policy that every medical aviator must practice instrument flying on a monthly basis in conjunction with assigned missions to maintain and improve his proficiency.

h. Aeromedical activities in RVN are fairly standard; however, certain techniques or refinements are necessary because of the area and type of operations. Some of these are:

(1) Requesting "Dust Off" Evacuation. Most frequently requests go direct to "Dust Off" Operations via FM radio. The "Dust Off" FM frequency is unclassified and known to all. In the event direct radio contact is impossible, the request may be relayed through the ground elements network to a Corps Tactical Operations Center which relays the request to "Dust Off" by land line, or FM radio. The requests provide "Dust Off" with the unit's location by grid coordinates, number of patients, severity of wounds and how the location will be marked. Dust Off aircraft are normally airborne within 3 minutes after the request is received and they contact the requesting unit as soon as possible, advising them of their expected time of arrival. The ground element then informs "Dust Off" if gunship assistance is necessary and if it has been requested. Upon arriving at the pickup site, the ground element normally identifies its position by use of a smoke grenade. "Dust Off" names the color of the smoke which is confirmed by the friendly ground element. This is a safety measure to avoid being led into an enemy ambush. Based on information from the ground element, "Dust Off" makes its approach which is usually steep and fast. The helicopter is guided to a position near the patients who are rapidly transferred onto "Dust Off" which departs as rapidly as possible. Time on the ground is minimized. There is no standard type of approach on a pickup. The aircraft commander must make his decision based upon information supplied by the ground element. In the event gunship

support is used, there is a distinct need to coordinate the approach so that maximum protection is provided. Variations of the pickup described above are those from small jungle clearings or holes blasted in the jungle. These require vertical descent between obstacles. The patient is often transferred to the helicopter while it is at a hover because of an unsuitable set-down area. Night missions are normally accomplished without the assistance of gunships. "Dust Off" is usually guided into the vicinity of the pickup site by Air Force Radar Control and then identifies the exact location by some type of visual signal such as flashlight, fire, flare, or vehicle lights. The ground elements are questioned in detail about the landing area with particular concern regarding any obstacles in the approach path. The approach is executed at a very steep angle. All lights on "Dust Off" are turned off and the landing light is not used unless absolutely necessary.

(2) Rescue Hoist Operations. The rescue hoist is an item of equipment which has been used more and more in evacuation. Due to thick jungle cover the hoist is often the only means of extracting the wounded. When a hoist operation is required, the requesting unit normally calls "Dust Off" on FM radio, gives the number of wounded and the location by grid coordinates. At the same time armed helicopters, in accordance with command policy, are request to provide suppressive fire support for the hoist operation. When "Dust Off" arrives at the location the elements on the ground mark their location with a smoke grenade and inform both "Dust Off" and the gunships of the enemy's position. Dust Off then approaches and hovers over the position of the wounded and lowers a lifting device which is attached to a steel cable. This is a coordinated action involving the pilot (keeping the helicopter over the exact spot), the crew member (lowering the lifting device), and the personnel on the ground. The gunships circle "Dust Off," providing suppressive fire as necessary. When the patient is secured to the lifting device the crew member raises him and pulls him into the helicopter. An electric motor supplies the power for the hoist. Since "Dust Off" helicopters are large motionless targets, they are particularly vulnerable during these operations and have been severely damaged and even shot down by hostile fire.

(3) Mobile Riverine Operations. Support of the 9th Infantry Division Mobile Riverine Operations has introduced a new element in combat operations that are supported by our air ambulances. These operations consist of highly mobile waterborne forces conducting operations on the rivers in the southern III CTZ and IV CTZ. A helicopter is field sited on board a self-propelled barracks ship (APB) on which is located a medical treatment facility.

i. Appreciation of the "Dust Off" workload and the risks assumed by aeromedical personnel can be gained by a review of the "Dust Off" statistics for the period August 1967 - June 1968 as shown in Figure 2. In regard to the item "Patients Evacuated," until December 1967 the category Free World Military Assistance Forces (FWMAF) included not only FWMAF patients but also RVN civilians, Civilian Irregular Defense Groups (CIDG), Regional Forces (RF), Popular Forces (PF), and Prisoners of War (PW). In December 1967 patients in the latter categories were listed as "Others."

Beginning in April 1968, RVN civilians were listed as a separate category. The steady increase in aeromedical workload and the gradual increase in the number of Republic of Vietnam Armed Forces (RVNAF) patients evacuated is of special interest. About 40-50% of the "Dust Off" workload is non-US. The number of helicopters allocated to the brigade is based on US workload only. It will be noted that the Tet offensive, which occurred in February, had a significant impact on the air ambulance support provided by "Dust Off." During February 1968 a record number of 16,685 patients were evacuated and this figure rose to 21,915 in May 1968. The heaviest evacuation requirements were in the III and IV CTZs. Another item of interest is the hoist operations. Those months with high hoist usage coincide with increased activity in I and II CTZs where terrain and thick jungle coverage dictate frequent hoist requirements.

11. GROUND EVACUATION OF PATIENTS

a. Although insecurity of roads limits the use of ground ambulances, they are still used for: (1) evacuation in base areas, (2) movement of patients to some of the CSFs, (3) accompanying convoys, and (4) other related missions.

b. During this period, 50% of the ground ambulances were deleted from divisions and separate brigades. The 44th Medical Brigade employs about 250 3/4-ton ambulances and 9 bus ambulances.

12. PRISONER OF WAR PATIENTS

a. At the beginning of this period the Prisoner of War (POW) patient census was about 180; currently it is 450 - 460, an increase of 150%. Medical facilities with security fencing and guards are established at Long Binh and Phu Thanh, a few kilometers west of Qui Nhon. Each facility is operated by an augmented clearing company and can provide only limited medical and nursing care to about 240 patients. Initial surgery and post-operative care for a number of days must be given in one of the regular USARV hospitals before the POW patient can be moved to one of the two medical facilities. This is not an ideal arrangement since it uses beds provided for US military, mixes POW patients with other patients, and requires a large number of guards.

b. To alleviate this problem two 250-bed hospitals with guard towers and security fencing are under construction, one at Long Binh and the other at Phu Thanh. These hospitals will have complete surgical facilities and will be able to provide a much higher level of patient care. Two field hospitals (1 HQ and 2 Hospitalization Units each) to operate the facilities are in the troop program.

13. SURGICAL BACKLOGS. Several times during the Dak To battle in November 1967, and more recently during the Tet offensive, some hospitals had surgical backlogs of 10 - 12 hours. Compounding the problem was the fact that surgical staffs had been operating for long periods of time before the backlog became excessive. In addition, there was no assurance that the flow of casualties would abate. The solution to this problem is to

anticipate backlogs before the hospital's surgical capability becomes overloaded. In some cases this requires "backward evacuation," i.e. some patients may be moved from evacuation hospitals to more distant surgical hospitals; some may be moved long distances to hospitals in another medical group area. The guiding principle is to get the patient to an available operating room as soon as possible. The availability of operating rooms (facilities and surgical teams), and NOT the number of available beds, is the important factor when large numbers of casualties descend on a hospital. During such emergencies, hospital commanders must place their surgical personnel on a shift basis. Otherwise, the surgical staff will become quickly exhausted and the situation will become unmanageable.

14. CALCULATING BED REQUIREMENTS "Bed requirements" usually are not calculated for a Field Army. Formerly hospital units were allocated on the basis of the number of units required to support a division or a corps. However, in planning the medical support for Vietnam, it became apparent that the planning tool of "bed requirements" was useful. Currently, hospital bed requirements are allocated by using a factor of 13.3 beds/1000 US troop strength supported. Through experience, this factor was arrived at by using daily admission rates and patient accumulation factors. The data follows:

DAILY ADMISSION RATES

DNBI 0.088 per 1000
IRHA 0.20 per 2000

ACCUMULATION FACTORS

DNBI 11.40 per 1000
IRHA 26.44 per 1000

The factor of 13.3 is calculated as follows:

$$\begin{aligned} \text{DNBI } 0.88 \times 11.40 &= 10.03 \\ \text{IRHA } 0.20 \times 16.44 &= 3.28 \end{aligned}$$

Bed Requirement Factor 13.31

Guidance for use of this factor stated that evacuation, field and surgical hospital beds would be considered for "bed requirements." Surgical hospital beds may or may not be included at times depending upon their employment. Because four of them are in MUST equipment and require little or no construction effort, it has been recommended they be omitted when reporting hospital assets. The bed requirement factor of 13.3 has proved to be a reliable figure during the past year. The degree of its reliability is measured by the percentage of beds occupied in the Field Army. Prior to the Tet offensive in late January and February 1968, the percentage of bed occupancy was relatively stable in the range of 50 to 55 percent. This was well below the prescribed limit of the desirable bed occupancy of 65 percent. Because there was a 10- to 15-percent difference in the rate, consideration was given to lowering the 13.3 bed requirement factor. However, the significantly heavy casualties during Tet pushed the bed occupancy rate up to and sometimes beyond the 65-percent limit. It is now evident that the bed requirement factor of 13.3 is a realistic guide for planning.

15. THE CHAIN OF CASUALTY EVACUATION AND TREATMENT. The individual patient and his medical/surgical problem should be the sole determinant of where and how he receives medical care. It may seem redundant, but primary care is simply preserving life for later definitive care. No dogmatic generalization of evacuation procedures can be made to fit the various tactical situations in Vietnam. The location of the casualty in relation to available medical facilities continues to be the important consideration. Because of continuing hostile action close to base camps where surgical or evacuation hospitals are located, it is logical, more expedient and physically possible to bypass the division medical facilities in evacuating casualties to hospitals. On the other hand, when operations take place far from base camps, such as in the Dak To battle, casualties are usually first seen and stabilized in division medical facilities (usually clearing stations, and sometimes battalion aid stations). In the Dak To battle, battalion aid stations and clearing stations played an extremely important role and saved many lives. They did a wonderful job of preparing the casualties for evacuation to the 71st Evacuation Hospital at Pleiku. It is completely unrealistic to insist that every patient must pass through every link of the chain of evacuation.

16. REDUCTION OF MEDICAL PERSONNEL AND EQUIPMENT IN DIVISIONS AND SEPARATE BRIGADES. Early in the report period USARV conducted a study of the utilization of medical personnel and equipment in divisions and separate brigades. This was stimulated by reports that medical resources in the divisions and separate brigades were excessive in some instances because of the nature of military operations. For example, ground ambulance evacuation, except in base camps, was almost nil because of insecure roads and the extensive use of helicopter transportation for troops and for evacuation of casualties. In some areas it was alleged that medical officers were not being fully utilized. An ad hoc committee of combat experienced senior AMEDS officers studied the problem by visiting each division and separate brigade. They made the following recommendations which were accepted for the present combat situation in Vietnam: (1) infantry division reductions - 24 wheeled ambulances, 49 enlisted AMEDS personnel (one NCO, 24 drivers, 24 ambulance orderlies); all brigade surgeons (duties to be assumed by medical company commanders); one medical officer from each medical company; (2) separate brigade reductions - 6 wheeled ambulances, 12 enlisted AMEDS personnel (drivers and ambulance orderlies); one medical officer from the medical company. The 1st Cavalry Division (Air Mobile) and the 101st Airborne Division were not included in the study because of the peculiarities of their employment. Generally the reductions have not affected the quality of division medical service. However, they have caused problems when medical officers were sick or on leave. The 4th Infantry Division has experienced considerable difficulty in providing adequate medical officer coverage in their extremely large tactical area of operations. Some of the medical officer spaces which were eliminated may have to be restored.

17. MEDICAL SUPPORT OF RIVERINE FORCES

a. Medical support of the Riverine Forces in the Delta has been a most interesting and challenging aspect of the USARV medical service. The operation is conducted by a joint Army and Navy force. Mobility is provided by

Navy vessels to include self-propelled barracks ships (APB), towed barracks ships (APL), landing craft (ATC and LCM) and other water craft. This is augmented by use of helicopter lift for inserting troops into an area of operations when appropriate. This high degree of mobility, the almost total absence of land lines of communication, and the limitations of landbased support facilities combine to complicate medical support activities.

b. Casualty evacuation is extremely difficult as litter bearers are not very effective in the mud and water of this environment. Dikes and other obstructions restrict boats to streams and canals where it is difficult to provide evacuation by boat or movement of a treatment facility, such as a boat-mounted battalion aid station, into a position to adequately support combat operations. As a result, the majority of casualties are evacuated by helicopter from the site where wounded, causing over evacuation in some instances.

c. Until early 1968 treatment facilities beyond the battalion aid stations aboard ATCs were limited to a surgical hospital at Dong Tam and hospitals in the III CTZ. The APBs in the Riverine Flotilla had a limited sick bay area aboard. Access to this facility required traversing ladders and narrow companionways, which all but precluded it as a treatment site for seriously wounded patients requiring movement by litter. As the area of operations expanded away from land-based facilities, there was an increased requirement for a facility which could serve as a triage point and provide resuscitative surgical support for the seriously wounded who would have difficulty in surviving an extended trip to a land-based hospital. In recognition of this requirement the APB COLLETON was modified to provide ramps from the helicopter landing pad on top of the ship to a triage area one deck below and from that area to the sick bay on the next deck. The sick bay area was enlarged to a second operating room, an intensive care unit, and an increased patient holding capability. Staffing of this newly created facility is accomplished jointly by the Navy and elements of the 9th Infantry Division medical battalion augmented by an operating surgeon and nurse anesthetist.

d. It is planned in the near future to add two more modified APBs to the fleet which will increase medical staffing requirements. Plans are also being developed to convert two LCM-8s or two LCUs to a floating medical facility.

FIELD SITE
LOCATIONS (HEL AMB)

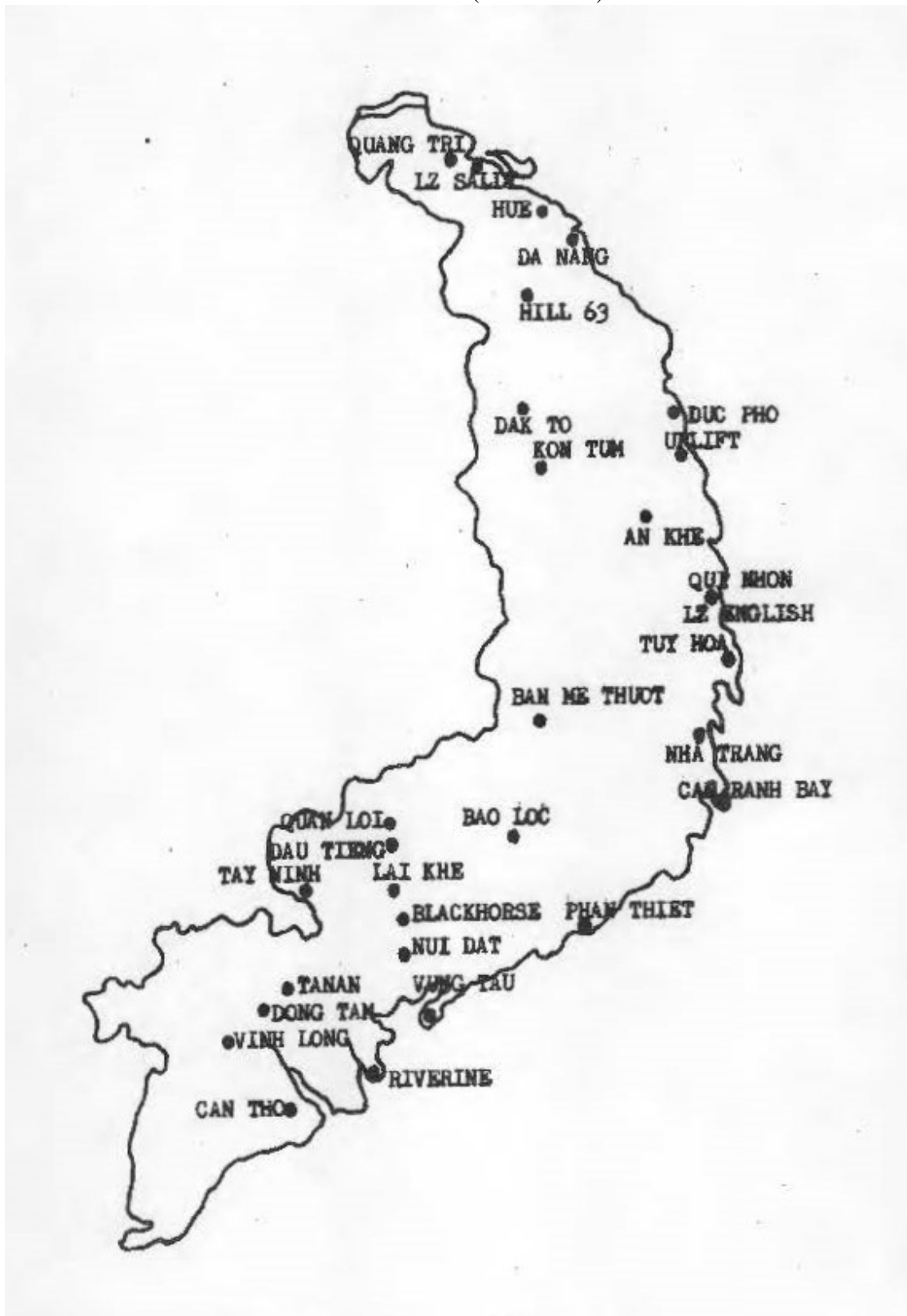


FIGURE 1
ANNEX D

DUST OFF STATISTICS
1967 - 1968

	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
Times Hit By Hostile Fire	16	23	24	19	54	28	54	28	29	54	25	354
Hoist Missions (Patients)	147	25	29	203	95	107	77	106	312	233	169	1503
Crewmen Killed	1	2	13	0	4	0	0	0	1	4	0	25
Crewmen wounded	9	7	3	11	2	14	11	4	8	19	2	90
Patients Killed	0	0	0	0	0	0	0	0	0	1	1	2
Patients wounded	2	0	0	0	2	1	0	0	0	0	0	5
Aircraft Combat Losses	2	1	4	2	4	2	5	3	3	3	0	29
Missions Flown	2994	3904	4369	4714	5383	5600	6755	6545	7329	8801	7437	63831
Flight Hours	2851	3232	3456	4032	4964	5964	5107	5448	6226	6975	5690	53945
Patients Evacuated:												
US	3710	3678	4088	5828	6090	7396	9332	8540	10570	11454	7179	77865
FWMAF	2328	1551	1625	2202	438	445	1104	622	526	757	611	12209
RVNAF	1318	1804	2067	1700	2813	2424	3327	2951	4081	5585	4466	32536
RVN Civilians									2390	3175	2697	8262
Other					1851	2255	3122	2818	513	944	481	11984
TOTAL	7356	7033	7780	9730	11192	12520	16685	14931	18080	21915	15434	142456
Average No Acft on Hand	56.5	79	78	84	103.1	101	99	101	103	109	110	93.1
Average Percent Aircraft Availability	65.4	64	72.5	70	78	70	63	73.2	74	70	68	70.8

ANNEX E

PROFESSIONAL SERVICES

1. MEDICINE AND PREVENTIVE MEDICINE

a. Malaria

(1) Incidence

(a) Although malaria is the most serious disease in Vietnam, the malaria rate decreased significantly during the past year. For the first five months of 1968 the rate has shown a downward trend when compared with the same period of 1967; the overall incidence has been reduced by about 35 percent (See Comparison Table below). This reduction has occurred in spite of a 23-percent increase in troop strength with a higher proportion of combat personnel, a greater contact with NVA troops in battle, increased exposure in the field, and disruption of malaria control programs in and around civilian communities. The percentage of vivax malaria during this five-month period in 1968 ranged from 41 to 54 percent. There is no comparable data available from this period of 1967 on the breakdown by type of malaria. US Army experience with malaria in Vietnam from 1965 through 1968 is shown in the following table:

INCIDENCE RATE PER THOUSAND PER YEAR

	1965		1966		1967		1968	
	<u>Cases</u>	<u>Rate</u>	<u>Cases</u>	<u>Rate</u>	<u>Cases</u>	<u>Rate</u>	<u>Cases</u>	<u>Rate</u>
Jan	0	0	181	18.0	616	29.6	579	20.6
Feb	0	0	130	14.6	420	23.7	377	15.0
Mar	0	0	280	27.9	471	21.8	328	11.3
Apr	1	1.3	658	52.5	615	26.1	511	17.5
May	3	2.5	448	32.7	763	30.3	611	22.4
Jun	3	1.8	688	52.3	873	36.0		
Jul	21	8.1	569	40.8	891	33.9		
Aug	28	8.0	280	19.4	660	24.6		
Sep	59	15.7	923	64.2	754	29.1		
Oct	623	85.8	707	43.6	1162	40.5		
Nov	1095	165.2	764	50.2	1072	40.5		
Dec	517	62.4	1054	59.4	842	30.7		

(b) Reporting by type of malaria began in August 1967 which provides information on the relative frequency of malaria as follows:

		FALCIPARUM	VIVAX
August	1967	63.7%	36.3%
September	1967	69.9%	30.1%
October	1967	75.1%	24.9%
November	1967	70.2%	29.8%
December	1967	63.1%	36.9%

(c) Experience has shown that the incidence of malaria varies not only with the geographic location of the unit but also with the type of assignment the man has in the unit. A four-month study (1 July to 30 November 1967) of a single combat division revealed the following breakdown:

TYPE OF ASSIGNMENT	PERCENT OF CASES
Combat Units	81
Combat Support Units	16
Combat Service Support Units	3

(2) Prevention

(a) We are convinced that when commanders are interested in preventing malaria, the incidence of the disease is low in their units. The mainstay of malaria prevention in Vietnam is chemoprophylaxis. Individuals assuming the highest risk are the infantrymen, particularly those in the jungle highlands away from their base camps. All personnel in USARV are required to take a weekly tablet of chloroquine-primaquine (C-P) tablet (combined 0.3 gm chloroquine base with 45 mgm primaquine base). In addition to this measure, the combat forces in the I and II CTZs are required to take 25 mgm of dapsons daily. Permissive authority for unit commanders in the III and IV CTZs to use dapsons prophylaxis as an additive preventive is given upon recommendation of their surgeons when the troops are exposed to known or suspected falciparum endemic areas. Other protective measures include the use of insect repellent, bed nets, and the process of covering the body during hours of darkness. "Malaria discipline" means that an individual takes the required tablet or tablets and exercises other protective measures to prevent malaria. Malaria discipline varies in effectiveness among units because of: (1) the extent of command emphasis by junior officers and senior NCOs; (2) the reported attitude of some soldiers that it is better to be hospitalized with malaria than to run the risk of being wounded or killed on combat operations (This cannot be documented and probably is directly related to the general morale of the unit and the intensity of combat.); (3) the significant number of reactions to the C-P tablet. Many individuals complain of abdominal cramping within 2 to 3 hours after taking the medication. This may be followed by a transient diarrhea. Others complain of headache, insomnia, and malaise. When available, soldiers will readily take plain chloroquine. When this is not available, they will skip C-P prophylaxis. Consideration should be given to the return to plain chloroquin prophylaxis or develop a less reactive C-P product.

(b) Daily dapsons prophylaxis potentially reduces the incidence of falciparum malaria 40 to 50%. Very few individuals complain of reactions to this drug but it has the disadvantage of requiring daily administration

(3) Treatment in General

(a) A presumptive diagnosis using three slides (each having a thick and thin section) should be made before any antimalarial treatment is given. All patients with the diagnosis of malaria are evacuated to field

or evacuation hospitals, where the diagnosis is confirmed. Therapy may or may not be instituted prior to transfer to the 6th Convalescent Center for the completion of the treatment. At times treatment may be initiated at forward installations using intramuscular (IM) chloroquine on presumptive or proven cases if: (1) evacuation will be delayed four or more hours, (2) the patient is toxic or disoriented, (3) patient has a temperature greater than 104°F.

(b) Treatment of Primary Attack of Vivax or Malariae Malaria (“Radical Cure”). This usually is in the form of oral therapy. An initial dose of 1 gm chloroquine phosphate followed in six hours by 500 mgm chloroquine phosphate; then 500 mgm chloroquine phosphate on the second and third day for a total of 1500 mgm daily of chloroquine phosphate. Primaquine 15 mgm daily should be started on the first day and continued for 14 days. Another form of therapy (parenteral) may be used if the patient is critically ill or where oral medication is not feasible. Chloroquine hydrochloride 250 mgm in 5 ml of unbuffered sterile water is given intramuscularly (IM). This may be repeated at six-hour intervals but the total parenteral dose in the first 24 hours should not exceed 1 gm of chloroquine hydrochloride. The same drug can be given slowly intravenously (IV) as above if diluted with 40 ml of sterile physiological saline. Oral administration of the drug should be substituted or resumed as soon as possible.

(c) Treatment of Falciparum Malaria - Oral Therapy. The usual treatment of the primary attack is by oral therapy. The 10-day triple drug regimen using quinine-pyrimethamine-dapsone is employed. Quinine sulfate is given 0.650 gm every 8 hours, day 1 through 10. Pyrimethamine (daraprim) 25 mgm is given twice daily, day 1 through 3 (total dose is 150 mgm), Dapsone (DDS) 25 mgm daily is given day 1 through day 27. (Patients who have been required to take dapsone as a suppressive drug will continue on this dose as long as exposed). The weekly chloroquine-primaquine tablet is resumed as soon as possible after the first week of therapy. The reason for this is to prevent the possibility of a vivax breakthrough in the event of a double infection (falciparum plus vivax).

(d) Treatment of Falciparum Malaria - Parenteral Therapy. A critically ill patient who cannot take oral medication will require intravenous medication. Quinine dihydrochloride (300 mgm/ ml) 600 mgm is diluted in 1 liter of isotonic saline or glucose/saline and given slowly, never in less than 30 minutes (because serious hypotension may occur when injected rapidly); this dose may be repeated every 6 to 8 hours so long as urine output is adequate; the total 24- hour dose should not exceed 1800 mgm. Oral administration of quinine together with pyrimethamine and dapsone should be substituted or resumed as soon as possible. NOTE: In the presence of oliguric renal failure, the 24-hour dose of quinine dihydrochloride should not exceed 600 mgm.

(e) Treatment of Falciparum Malaria Therapy Failures (Recrudescence or “Relapses,” but not Reinfections). Patients who fail to respond to a full course of quinine-pyrimethamine-dapsone or who demonstrate a persistent parasitemia after such therapy are treated with the following regimen: quinine sulfate 0.650 gm every 8 hours, day 1 through day 10; pyrimethamine

25 mgm twice daily, day 1 through day 3; sulfasoxazole (gantrisin) 0.5 gm every 6 hours, day 1 through day 5. This regimen may be used when a hypersensitivity to dapsone exists but will not be employed in the treatment of reinfection.

(f) Course of Action After Triple Drug Therapy For Falciparum Malaria. No patient should be returned to duty unless his hematocrit is 36 vol % or higher. If parasitemia is absent at the end of the 10-day treatment regimen, the patient is returned to duty shortly thereafter. Physical reconditioning is instituted usually 3 to 4 days after the patient is asymptomatic. Those with a significant anemia or a leucopenia require longer convalescence.

(g) Treatment of Double or Triple Strain Infections of Malaria. The true incidence of double infections of malaria among US troops is not known. It is thought to be about 6 to 8% and is usually vivax and falciparum. Triple infections occur rarely. It is not uncommon to have one species suppressed so that the identity of the species is difficult or impossible with study of the peripheral blood smear. Usually, the vivax infection is suppressed and emerges during the course of treatment for falciparum malaria. When a double infection has been identified at the onset, treat for the more serious infection (falciparum) and employ the weekly chloroquine-primaquine tablet early in the course of treatment after the patient has been afebrile for 72 hours. It may be necessary to employ a course of chloroquine therapy to adequately suppress the vivax infection, with resumption of the chloroquine-primaquine tablet soon afterwards to effect a radical cure. If the vivax infection relapses then the 3-day chloroquine regimen should be employed followed by primaquine 15 mgm daily for 14 days.

(h) Most patients with malaria are discharged within 5 days of the completion of their therapy at the 6th Convalescent Center. Since they have been in the hospital system 2 to 5 days prior to their arrival, the total time lost from duty for the average patient with falciparum malaria is 17 to 19 days; for vivax malaria, 12 to 15 days.

(i) Splenectomized patients are no longer evacuated out of country but assigned a P-3 profile and given assignment restrictions to low incidence malarious areas. Data is collected on each soldier. Thus far, several soldiers without spleens who have contracted malaria tolerated the disease as well as those with spleens.

b. Infectious Hepatitis

(1) Incidence. In 1967 there were 2,311 new cases recorded, 2,108 or 92 percent were US Army personnel. During the first third of 1968 there were 770 new cases; no significant difference from the 1967 incidence. The usual range of morbidity is from 5.5 to 7.5/1,000/year.

(2) Prevention, Most of the hepatitis in Vietnam is probably water or ice borne. An intensified effort has been made to clean up and sanitize the local ice industry by wide dissemination of a USARV regulation, "Sanitary Standards for the Manufacturing and Handling of Ice" in English and Vietnamese. In addition, a program of detailed inspections of division

and unit water points was undertaken. The findings strongly indicated that they were a major source of the continued high incidence of hepatitis. Major discrepancies included: lack of water quality control devices (chlorine-PH comparator sets and reagents); poor maintenance of water production equipment (Erdelators); and a lack of trained operators. Production and use of potable water necessitates the care and attention of commanders, surgeons, engineers, and most important, the individual.

(3) Treatment. In general, the disease has been relatively mild. There have been only two deaths in the past year--both from acute massive necrosis of the liver. Most patients are treated after the diagnosis is established at the 6th Convalescent Center. Some cases require as many as 50 days of treatment but the average of all cases is about 43 days. All patients are treated in Vietnam except those nearing the completion of their tour. The primary concern of hepatitis to commanders and medical officers has been the great time lost from duty. Bed rest and adequate diet has been standard therapy since World War II. Until recently this regimen was not questioned. However, there is a very important study now in progress at the 6th Convalescent Center which includes evaluation of the effects of exercise during the active phase of hepatitis. Initial results have been encouraging. The final results may well change our concepts of the necessity of bedrest and may reduce the time of ineffectiveness to a significant degree.

c. Diarrheal Disease. The incidence of diarrheal disease continued to be high. The diarrheal admission rate during the past year varied from 31.0/1000/year in February 1968 to 67.2 in May 1968. The peak incidence months were April, May and June. It is known that many patients with milder diarrhea are treated on an outpatient basis or do not seek medical care at all; therefore, the true diarrhea rate is much higher than the admission rate. As more laboratory facilities and better means of transportation of specimens to the laboratories became available, the number of stool cultures increased. The results of these stool cultures indicated that a large proportion of the diarrheal disease is shigellosis. However, some of this apparent increase in *Shigella* may be due to seasonal variation, since *Shigella* has not been as readily isolated during the months of lower diarrheal incidence. A recent outbreak of shigellosis, due to a contaminated water supply, in the 1st Cavalry Division resulted in over 7,000 cases of diarrhea. The sources of diarrheal outbreaks have been repeatedly traced to contaminated water and nonpotable ice, and a few times to locally procured food stuffs. A number of food poisoning outbreaks due to staphylococcal enterotoxin have occurred, and were related to improper refrigeration or holding of food too long at ambient temperatures prior to serving.

d. Fever of Undetermined Origin (FUO) Statistics on FUO, based on morbidity reports, were determined to be too inaccurate for a meaningful interpretation. A study conducted in December 1967, which compared FUOs on clinical records cover sheets and field medical cards against those reported on morbidity reports, revealed a large discrepancy. The reason for this is that line 118 of the morbidity report, in addition to FUOs, includes diagnosis undetermined, and certain ill-defined conditions. Also

man individuals are admitted as F.U.O. patients, then are definitely diagnosed later but are not deleted as F.U.O. The reported F.U.O. rates are probably inflated by a magnitude of about 200 percent. Serologic surveys are being conducted by the 9th Medical Laboratory in cooperation with other medical personnel in an attempt to define this problem. Preliminary results have indicated that the etiologies of F.U.O. vary with seasons and with the ecological conditions in the geographic area. Agents causing a rather high frequency of F.U.O. have been scrub typhus, leptospirosis, melioidosis (certain areas) dengue, chikungunya and other groups A and B arboviruses. Malaria is the cause of a high percentage of F.U.O. admissions but after a number of blood smears, these cases are later diagnosed. The magnitude of the F.U.O. problem is not as great as would appear from past statistical data.

e. Venereal disease.

(1) Incidence. The monthly venereal disease rate usually varies between 200 to 260/1000/year. Gonorrhea, which accounts for over 90 percent, has a rate varying from 184 to 244. Syphilis, a lesser problem, has an incidence of about 1 to 2/1000/year. Other forms of VD comprise the rest.

(2) Prevention and Control. Civilian public health programs for control of VD are virtually nonexistent; therefore, a large reservoir of VD exists in the female civilian population. The VD control program in USARV emphasizes troop education concerning the hazards of VD; use of prophylactics during exposure; and the early detection, prompt diagnosis and treatment of infected personnel. All soldiers, shortly after they arrive in country, are briefed on the following points; (1) the desirability of sexual abstinence, (2) the high incidence of VD among prostitutes, (3) the symptoms and signs of VD, (4) the use of proper prophylaxis if exposed, and (5) the necessity to seek prompt treatment at a medical facility if VD is suspected. Contact tracing is attempted, but is rarely successful. The only time the rate declined appreciably during the past year was following the Tet offensive.

(3) Treatment. Because it is the major problem, only gonorrhea will be discussed. (Syphilis is treated in the usual manner.) The growing awareness among physicians in the US and other areas of the world that strains of gonococcus were emerging less sensitive to the action of penicillin made standardization of treatment all the more important here. Several clinical trials of therapy were conducted. The following treatment schedules have been recommended and promulgated to all medical officers:

(a) SCHEDULE 1: 2.4 million units of aqueous procaine penicillin I.M. plus 1.0 g probenecid (benemid) orally at the time of injection followed by 0.5 g at 6- and 12-hour intervals. A cure in excess of 90 percent can be expected with this method. Treatment failures are given Schedule 2.

(b) SCHEDULE 2: 4.8 million units aqueous procaine penicillin I. M. plus 1.0 g probenecid orally at the time of injection followed by 0.5 g at 6- and 12-hour intervals.

(C) SCHEDULE 3: The following schedule is used when a sensitivity to penicillin is elicited or when there is refractoriness to Schedule 1 or 2 above, or when there appears to be organisms other than the gonococcus responsible for the acute or chronic urethral discharge. Tetracycline 2500 mg (10-250 mg tablets) is given as the initial dose and repeated in 12 hours - total dose, 5 g. Reactions have been minimal and limited to slight nausea, occasional late vomiting or light-headedness.

(d) SCHEDULE 4: An alternate form of tetracycline may be used if other methods prove ineffective and the patient can be relied on to take the medication without interruption. A priming dose of 1.5 g Tetracycline (6-240 mg tablets) followed by 0.5 g every 6 hours for 4 days.

(e) Standardization of treatment should minimize the tendency of the gonococcus to develop resistance. This reduces time lost from duty due to repeated clinic visits and ineffectual therapy.

f. Plastic C-4 Explosive. In January 1968 there began to appear in our hospitals patients who presented with convulsive seizures, marked motor irritability, restlessness, and some degree of disturbance of sensorium. At first it appeared they were suffering from accidental exposure to one of the halogenated hydrocarbons used as insecticides such as DDT or Dieldrin. After detailed history it was determined that they had either chewed or ingested some of the plastic explosive C-4, widely used in demolition and also used by some soldiers to heat combat rations since it burns with a clean, hot blue flame. The initial symptoms appear within a short time as clonic seizures, agitation, or some disturbance in consciousness. Characteristically, the seizures are refractory to a large dose of anti-convulsants. There is usually some degree of hyperpyrexia and neutrophilic leucocytosis that subsides within a day or two. Urine suppression may occur with an associated increase in blood urea nitrogen but over several days will return to normal. There may be signs of hepatotoxicity as manifested by abnormal liver enzyme values. Recovery is usually complete, but some patients have a complete amnesia concerning the events precipitating the illness. The active ingredient is cyclical hydrocarbon trimethylene-trinitramine (RDX, Cyclomite, Hexogen, T-4); it is insoluble in water but soluble in acetone and alcohol. It appears to be absorbed slowly from the stomach but this could be enhanced through ingestion of alcoholic beverages. The explosive contains small amounts of motor oil, polyisobutylene and an inert plastic stabilizer. To what extent these contribute to the toxic properties of C-4 is not known. Department of the Army has been advised of the hazards of C-4 so that training cadres will be properly informed. Information revealing the hazards of chewing or ingesting this explosive has been disseminated to all combat units in RVN.

g. Dermatology

(1) Skin disorders cause a great deal of ineffectiveness among troops in Vietnam. Dermatomycoses, monilial infections, cellulitis, furunculosis, acneiform eruptions and contact dermatitis comprise the majority of problems.

(2) The most significant cause of non-effectiveness among Mobile Riverine Forces of the 9th Infantry Division operating in the IV Corps Tactical Zone is an inflammatory dermatophytosis that may involve a skin area from the toes to the pelvis. Wet foot injury has not been a problem because troops do not remain immersed in water long enough to develop it. A dermatologist assigned to the division tried silicone ointment but it was unsuccessful since it was messy, ruined socks, had to be applied once every 24 hours to be effective, and the ointment did NOT protect against fungus infection.

(3) A lightweight mesh boot devised by the division surgeon has been found ineffective since it provides less protection than the standard tropical boot against stones, mud and bites, and the foot still remains wet and susceptible to injury. Wool socks in this environment should not be worn because they absorb and retain water and are more irritating to the skin than the lightweight synthetic fabric socks that are being tested.

(4) Preliminary observations on the use of prophylactic griseofulvin therapy over a 2-month period have been very encouraging. Three groups of 50 were followed; one received 1 gm of griseofulvin in 2 divided doses; the second group received 500 mg daily; and the third served as a control. The incidence of fungus disease in the control group was 38%; in those taking 500 mg, 8%; and in those taking 1 gm griseofulvin, only 3%. No adverse effects were noted in this dosage.

(5) Tinactin, a liquid anti-fungal agent, is superior to desenex ointment for dermatophytosis restricted to limited areas, e. g. groin, small patches on the trunk, extremities or feet. Also, Tinactin can be used as a substitute for griseofulvin for this purpose.

h. Renal Unit. The end of April 1968 marked the second anniversary of the renal unit in Vietnam. There were 48 patients the first year and the overall survival rate was 58%. The lowest mortality rate (23%) was in medical causes of acute renal failure (ARF). The greatest mortality rate (60%) was among patients with multiple wounds and gastro-intestinal injury. The second year witnessed a large number of patients referred to the renal unit - approximately 88 patients of whom 59 had acute renal failure; 48 patients were treated with either extra-corporeal hemodialysis or peritoneal dialysis. A total of 90 hemodialyses were performed in addition to 18 peritoneal dialyses. This increase is directly related to the increased awareness by medical officers of clinical situations that predispose to acute renal failure. The discrepancy between total referrals and actual cases of acute renal failure amenable to treatment indicates there is a need for better understanding of the unit's function. A general summary of last year's experience is as follows:

<u>ACUTE RENAL FAILURE</u>	<u>NO. PATIENTS</u>	<u>NO. TREATED</u>	<u>NO. SURVIVED</u>	<u>% SURVIVED (TREATED PTS)</u>
Medical Causes	22	19	13	68.4
Surgical Causes	<u>37</u>	<u>29</u>	<u>8</u>	<u>27.5</u>
TOTAL	59	48	21	43.8%

i. Snake Bites. Snake bites have been a minor problem in RVN. Contrary to the report appearing in the May 6, 1968 issue of the Journal of the American Medical Association stating that 5 to 10 American combat men die each year from snake bites in Vietnam's jungles, not a single death among US troops has been recorded during 1967 and thus far in 1968.

j. Environmental Sanitation.

(1) Water Supply

(a) Much of the sanitary engineering effort during 1967 was devoted to surveying and evaluating new water sources in cantonments. The large USARV well drilling program was well advanced by the time sufficient engineers could be employed for evaluating well construction and water quality. Water supply policy, doctrine, equipment, and procedures were studied by the Army Concept Team in Vietnam (ACTIV) and their report was published during December 1967. Coordination with the Surgeon, USARV on plans and designs for new water supply construction improved greatly during 1967. From a technical standpoint, perhaps the greatest single health hazard associated with USARV water supplies was lack of competence in their operation. Military operators lacked training, motivation, and supervision. Civilian operators, mostly third-country nationals, were somewhat better. Chlorination of the water to 5 ppm Free Available Chlorine was probably the main reason little waterborne disease was seen. During the first six months of CY 1968 USARV Regulation 40-45 was prepared. This delineated individual and command responsibility for production of potable water, prescribed specific standards for production, and required approval of the USARV Surgeon for potable water sources and the degree of treatment required. During this period a detailed survey was undertaken of all water sources used by USARV troops in RVN and a register prepared describing the systems.

(b) Several waterborne diarrheal disease outbreaks at base camps and forward areas in the early spring pointed up the need for emphasizing water discipline to individuals and unit commanders at all levels. The USARV Sanitary Engineer and personnel of the 20th Preventive Medicine Unit (Svc) (Fld) conducted staff and technical visits to the several divisions to reinforce the need for continuing command emphasis and technical supervision of potable water sources.

(c) The following specific action was initiated to improve the quality of water supplied troops: (1) procurement action with 14th ICC to supply proper chlorine - pH comparator kits to division water point; (2) preparation and dissemination of USARV Poster 52 on Free Available Chlorine Determination; (3) preparation of a training course for refresher training of engineer water point operators. It is planned that this be conducted by the 20th Preventive Medicine Unit (Svc) (Fld) within each division. It will include instruction on water quality control procedures; (4) procurement of reagent set (sodium arsenite, orthotolidine and wide-range pH indicator solutions) for issue to water point operators; and (5) revision of USARV Regulation 40-45, Water Supply.

(2) Ice Sanitation. Several outbreaks of diarrheal disease and infectious hepatitis in USARV were attributed to contaminated ice. A third of the ice consumed by units was purchased from approved civilian vendors; however, the quality of the ice was frequently unsatisfactory. A new USARV regulation, specifying standards for the manufacturing and handling of ice, was published. All Army and civilian ice plants were reinspected and improved to meet the new standards. The procurement of potable ice from Vietnamese sources has often been complicated by the employment of an approved broker who arranges delivery. The ice delivered may not have been manufactured in an approved plant. A simple test for determining quickly whether ice has been frozen from chlorinated water was developed by the 20th Preventive Medicine Unit to detect nonpotable ice. Subsequent to the publication of USARV Regulation 40-20 "Sanitary Standards For The Manufacture And Handling of Ice" and the increased efforts by the USARV Veterinary Service and the 20th Preventive Medicine Unit (Svc) (Fld) to supervise this activity, few cases of disease have been traced to this source. However, troops in the field still persist in buying ice from nonapproved, nonregulated ice plants resulting in a relatively high incidence of diarrheal disease and hepatitis. This practice will be reduced through added command emphasis.

(3) Waste Disposal. Conventional military techniques were used for the disposal of excreta away from base camps. Burn-out latrines and urinals proved satisfactory in small cantonments, although the operation of burn-out latrines requires large amounts of fuel and considerable labor. However, in the large cantonments the burn-out latrine proved to be generally unsatisfactory for more than brief periods of time. The concept of using sewage lagoons (oxidation ponds) with waterborne sewage was determined to be the most satisfactory method of excreta disposal where sufficient land is available, and a large pond was successfully opened at Long Binh Post during October. This method runs raw sewage through a series of ponds and allows for natural stabilization of solids and nutrients in the sewage to occur by action of algae and bacteria. The final effluent is discharged from the ponds after chlorine treatment. This system requires little maintenance and costs half as much as conventional sewage plants. Several systems are now operating successfully. However, the priorities established within the construction program precluded any major development of waterborne sewage systems by the year's end. During the the [sic] first six months surveys were made of the major subarea commands to determine requirements for waterborne sewage. Engineer plans for waterborne sewage were reviewed by the USARV Sanitary Engineer Construction is scheduled for FY 1969 and FY 1970. The 20th Preventive Medicine Unit (Svc) (Fld) undertook a survey of excreta disposal practices by US Forces in RVN and related costs of the several methods. This study was not completed by the end of June 1968; however, preliminary figures indicate that the burn-out latrine method is at least as expensive in manpower and materials as conventional waterborne sewage and sewage lagoon treatment

k. Field Sanitation Training

(1) One area needing special emphasis for all company grade officers and NCOs coming to Vietnam is Field Sanitation. This added emphasis is required not only for AMEDS personnel but also for junior line officers and NCOs.

(2) Those areas having a particular impact on troop health which should be covered in detail are:

(a) Field Water Supply - methods of purification, individual responsibility, and unit (command) responsibility

(b) Field Mess Sanitation

(c) Indigenous Food and Drink Hazards

(d) Ice Sanitation

(e) Field Waste Disposal - individual responsibility, and unit (command) responsibility

(f) Personnel Hygiene - individual food handlers, barbers, et cetera

(g) Malaria Discipline Responsibility - individual and command

(h) Field Sanitation Team Training

(3) Because a working knowledge of all aspects of field sanitation at the unit (company) level is considered so essential to a health-effective command, it is recommended that at least one week of specialized instruction and applicatory training in field sanitation to include at least the above listed topics be given to all company grade officers and NCOs coming to RVN.

1. Aerial Spraying of Insecticide. In general, aerial spraying is believed to be ineffective in the control of malaria in Vietnam. This is due to the fact that the infantryman contracts the disease in relatively inaccessible jungles far from base camps. Only one Air Force C-123 aircraft and six prototype helicopter spray rigs have been available. Poor weather, hostile fire and maintenance problems have contributed to the problem of area spraying. Nightly fogging with insecticides and other less spectacular insect control measures are more effective and far less expensive.

2. SURGERY

a. Wounds in Vietnam

(1). Wounding Agents. Wounding agents vary in this conflict from previous wars. During the Korean War approximately 70% of wounds were due to fragments but in Vietnam during 1966 and 1967 the causes of wounds were: fragments, 53%; bullets, 32%; and 13% from many other agents, including punji sticks. Early in the conflict punji stick injuries occurred in 5 – 6% of all casualties; however, recently this has become an infrequent wound. In many respects wounds in Vietnam are more severe than in Korea because of a higher incidence of injuries due to bullets, mines, and booby traps. Mines and booby traps cause severe local destruction due to the close proximity of the explosion to the body. Tremendous amounts of dirt,

mud, and other secondary missiles are hurled into the tissues. This massive local contamination poses a challenge to the surgeon during debridement due to open fascial planes and spread of gross dirt. Careful judgment and experience is required to manage this type of wound. The surgeon must often choose between radical excision of potentially salvageable tissue and leaving behind a source of infection. Of 183 traumatic amputations, 72 - or 39% - were due to mines.

(2) Location of Wounds. The type of wounding agents and the use of protective devices has modified the regional distribution of wounds. As noted in Figure 1, head and neck wounds occur in 12.8% of IRHA. Failure to use the helmet has been responsible for many deaths. The present helmet will offer protection against almost all fragments; however, it will not deflect high velocity bullets. Since failure to wear the helmet is caused by the objectional [sic] features of the present design, a better helmet must be developed - one which the troops like to wear. Chest wounds are present in 7.5% of IRHA admitted to the hospitals. The flack jacket affords protection against 75% of fragments; for this reason the relative incidence of gunshot wounds of the chest has increased. Of penetrating wounds of the thoracic cage, 60% have been due to bullets. The majority of casualties with wounds of the heart and great vessels will not survive to reach the hospital. On the other hand, penetrating wounds involving only the lung have a low mortality rate. The incidence of abdominal wounds is about the same as during the Korean conflict, 5 - 6%. The most frequently injured organ is the small bowel. This is closely followed by colon injuries. In some series, colon wounds will exceed small bowel wounds in frequency. Other abdominal injuries in order of frequency involve the liver, kidney and spleen. Major liver wounds is the most common cause of death among abdominal injuries. The upper extremities account for 19% of combat wounds. Owing to the lack of protection, fragments cause the majority of extremity wounds. Lower extremity wounds account for 36% of IRHA. As noted above, mines and booby traps are the most frequent causes of the severe lower extremity wounds. About 18% of casualties have other wounds, i.e. burns, contusions, multiple injuries, which are not principally confined to one body area.

(3) Causes of Death. Figure 2 shows the percent of deaths by body region. As one would suspect, injuries to the vital regions - head, chest, and abdomen - cause about 78% of deaths, Forty percent of the deaths among IRHA admitted to the hospitals are due to head wounds. More than 40% of these have evidence of fatal wounds upon admission. The gross mortality rate of all patients, both civilian and military, who are admitted because of craniocerebral wounds, is 50%, Those with destruction beyond repair are treated expectantly; those operated upon have a low mortality rate, about 6 - 8%. Wounds of the chest cause 20% of the hospital deaths. These are usually destructive wounds of the great vessels, mediastinum, heart, and thoraco-abdominal injuries, in which control of extensive bleeding is an unsurmountable problem. Abdominal wounds account for 18% of deaths. Severe wounds of the liver, kidney, spleen, pelvis and great vessels pose a challenge in obtaining hemostasis. The majority of these deaths are from extensive liver destruction or multiple organ involvement. Few deaths are caused from upper extremity wounds. Lower extremity wounds

are a more serious problem, mainly due to the extent of destructive pathology. Deaths from lower extremity wounds are usually in casualties in extremis with traumatic amputations who have been quickly evacuated from the field. In other conflicts, or in the absence of rapid evacuation, they would have died before they could be evacuated. About 18% of deaths occur in casualties having injuries not primarily confined to one area; burn wounds are also included in this group. Figure 3 compares the percent of wounds by body region and percent of deaths by region.

(4) Time of Death. The relation between time of death and admission of general surgery patients is shown in Figure 4. Casualties with craniocerebral trauma have been excluded. As previously noted, more than 40% of casualties with craniocerebral wounds have evidence of fatal head injuries upon admission and are treated expectantly. Deaths occurring in the receiving ward, or prior to surgery, have uncontrolled bleeding of such magnitude that resuscitation is impossible. Deaths during surgery, 26%, are usually from blood loss due to extensive wounds in the thorax and abdomen. Deaths during the first postoperative day, 22%, are in the same category. The principle difference is that surgery could be completed. However, owing to prolonged shock, continued bleeding, and injuries to the lungs, deterioration relentlessly progressed to demise. The deaths occurring from the time of admission to the end of the first postoperative day represent cases with severe trauma upon whom every human effort has been expended to save them. Salvaging more of these casualties would require immediate surgical capability in the receiving area, availability of cardiopulmonary bypass, standby surgical teams, and the use of an inordinate amount of fresh blood and other therapeutic agents. Deaths beyond the second postoperative day are usually caused from complications. The most common problem has been pulmonary failure due to a variety of causes. The second most frequent cause of death is sepsis. To prevent these deaths requires (1) overall upgrading in the quality of medical and nursing care, (2) elimination of all errors in surgical technique, (3) avoidance of missing a serious injury because of hasty examination, and (4) provision of better postoperative care, especially of the pulmonary system. The newly assigned surgeon must be indoctrinated in the principles of combat surgery and supervised until the techniques are mastered. To provide better postoperative care of the lungs, inhalation therapists are required.

(5) Disposition of IRHA. During the period January 1965 through January 1968, 61,900 Army troops were wounded. Of these, 30% sustained minor wounds and were returned to duty without admission to a medical treatment facility. Fifteen percent were treated in clearing stations. Fifty-five percent, or 33,930, were admitted to a hospital. Figure 5 shows the disposition of these casualties. About 73% have been returned to duty - 50% in Vietnam, 15% in CONUS, and 8% in the Pacific area. Approximately 8% remain hospitalized, 6.5% have been medically separated from the Army and 2.5% have died. The mortality rate of casualties admitted to hospitals in this conflict is essentially the same as the Korean War, it is markedly improved over the 4.5% for World War II. The rapid evacuation system using helicopters brings to the hospitals many patients who are mortally wounded yet survive to reach the hospital and

are counted in the mortality statistics. In other conflicts they would have died on the battlefield and been counted among the "killed in action." In some respects, wounds in Vietnam are more severe than in Korea owing to the increased incidence of wounding from bullets, mines, and booby traps. A more realistic measure of the effectiveness of medical care is the save rate. The rates between killed in action and wounded in action are shown in Figure 6. All of these wounded were admitted to treatment facilities. Assuming the wounds in Vietnam are just as lethal as in Korea, for each 1,000 casualties 58 more are saved in Vietnam than in Korea or more than 2,000 lives among Army casualties between January 1965 and January 1968. Figure 7 compares the casualty admission rates per 1,000 troops per year for the last three conflicts. In Vietnam the combat loss rate is 19.2 per thousand troop strength per year as compared with a rate of 43.2 for Korea. If the percentage ratios between surviving wounded to total wounded is computed, it is seen that 70.7% survived in WWII, 73.7% survived in the Korean War and 81.5% have survived in Vietnam. The extensive use of helicopter evacuation is the only new factor contributing to the high save rate in Vietnam. Other contributing factors are improved surgical techniques, forward location of treatment facilities, ready availability of blood, modern hospital wards, increased use of body armor, better survival gear, and intensified rescue activities.

b. Head Injuries. Casualties with craniocerebral injuries are admitted to "total head care" centers where there is a team consisting of a neurosurgeon, ophthalmologist, oral surgeon, otolaryngologist, and plastic surgeon. The coordinated team approach provides the highest quality of care for wounds involving the head and neck. For penetrating brain injuries debridement of all devitalized brain and removal of bone fragments is the key to preventing infection. The dura is always closed watertight. When postoperative x-rays demonstrate retained bone fragments, reoperation is indicated. Wounds of the soft tissues of the face and neck are carefully debrided and then closed primarily. Anatomical restoration will prevent the need of multiple plastic procedures subsequently.

c. Abdominal Wounds. Wounds of the stomach and small bowel are closed primarily. If several small bowel wounds are close together, resection of a segment of small bowel and end-to-end anastomosis is performed. Very few complications follow small bowel injuries. Small wounds of the ascending colon are closed or treated with a tube. Larger wounds require an ileo-transverse colostomy. For wounds distal to the middle colic artery, exteriorization is the method of choice. When this is not feasible, the wound is closed and a proximal colostomy performed. For wounds of the rectum, a double barrel diverting colostomy is required and the presacral space must be drained widely. The incidence of pelvic infection is very high unless both procedures are done. Primary repair of a wound of the colon distal to the middle colic artery should never be done unless a proximal colostomy is performed. Small penetrating wounds of the liver are treated by drainage. Larger wounds with devitalized liver require debridement to prevent sepsis. When a lobe is shattered, partial or complete lobectomy may be necessary. The key to the successful treatment of liver wounds is proper debridement, hemostasis, and good drainage; without careful attention to these procedures, the incidence of hepatic abscesses is high.

d. Chest Wounds. Penetrating chest wounds with hemopneumothorax are treated initially by a closed tube thoracotomy. When bleeding is excessive, immediate operation is performed. About 85% of penetrating wounds of the chest are successfully treated by a tube alone. Those requiring open thoracotomy usually have bleeding from the chest wall, great vessels or heart. Infrequently lobectomy or pneumonectomy is required for a massive wound of the lung. The incidence of empyema and decortication is very low, approximately half the rate in the Korean War. The use of tubes and good pulmonary care has been responsible for the improvement.

e. Vascular Injuries. Approximately 2% of IRHA admitted to the hospitals will have significant vascular injuries. To date, about 2,000 vascular repairs have been performed in Vietnam. These cases are registered at the vascular registry at Walter Reed General Hospital. Arterial wounds are resected and either an end-to-end repair made or a reversed vein graft is inserted. About 60% require vein grafts. The amputation rate following arterial repair is related to the extent of pathology in the extremity. Cases with severe fractures and soft tissue trauma may have irreversible changes; salvage of an extremity justifies an attempt at repairing even the severe wounds. The amputation rate following repair of all peripheral arteries is 13%. Without a repair the amputation rate would be 40%.

f. Orthopedics. Proper debridement is the key to successful treatment of extremity wounds and provides the best means of reducing morbidity and mortality. Devitalized muscle is recognized by its dark color, soft consistency, noncontractility and decreased bleeding of the cut surface. Small loose bone fragments are removed, large fragments with viable muscle attached are preserved to maintain length. The wounds are left open for delayed primary closure. Fractures are managed by manipulation and external casting procedures. The use of metallic fixation agents in early care of battle casualties is contraindicated. Splints are invariably broken during evacuation. Accordingly, circular casts are used. The cast is dated and a line drawing of the fracture made to orient medical personnel at successive echelons. Casts are bivalved or monovalved and circular dressings cut down to the skin to prevent constriction. Amputations are performed at the lowest feasible level. Viable skin flaps and soft issue is preserved for subsequent use during revision of the stump. Skin traction is applied to stumps to prevent exposure of bone and hasten healing. Hand wounds are not closed. Tendons are debrided and covered with a layer of vaseline gauze when drying is a potential hazard. No primary tendon or nerve repairs are performed in Vietnam. Foot wounds have been a problem due to indolent infections. These result from massive contamination from the injury and a tendency to be too conservative with debridement. The bulk of soft tissue is on the plantar surface and plantar incisions are required for exposure, With the exception of digital nerves, primary nerve repairs are avoided. Nerves are minimally debrided and the injury described on the operative note. The nerves are not tagged although the PACOM surgeons have recently recommended that the epineurium should be tacked to the surrounding soft tissue to prevent additional retraction.

g. Burns. Casualties with only minor burns are treated and returned to duty in Vietnam. Patients with major burns are resuscitated according to the Brooke Formula, debrided, dressed, and prepared for early evacuation to the burn treatment center in Japan. Patients with burns of more than

40% body surface area or with severe face burns are evacuated as soon as possible; others are evacuated within 48 hours in order to begin sulfamylon therapy in Japan. About 40% of burns are due to preventable accidents; this problem needs command emphasis. Sulfamylon is used for burn wound therapy on military patients retained in Vietnam and also for the local nationals.

h, Anesthesia. General anesthesia is employed in the majority of patients undergoing surgical procedures in Vietnam. Halothane is the agent of choice due to its nonexplosive quality, ease of administration, safety, and low incidence of complications. Regional or spinal anesthesia is limited to patients with extremity wounds. Prompt evacuation of casualties presents patients to the hospital in extremis who would have been counted among the KIAs in other wars. Pending arrival of blood, electrolyte solutions are rapidly infused to increase the intravascular volume. Depending upon the urgency of the situation, type O blood or type specific blood is given. When four units of type O blood have been used, this type is continued thereafter for a 2- to 3- week period. In the presence of continued blood loss, early operation is considered an important part of resuscitation.

i. Blood

(1) About 90% of the blood used in Vietnam comes from CONUS; the remainder is obtained from donors in Japan, Okinawa, and Korea. Blood is typed and cross matched twice in CONUS, once at the time it is drawn and once at the depot at McGuire Air Force Base. This blood is again typed and cross matched at the 406th Medical Laboratory in Japan before being sent to Vietnam. It arrives in country 4 to 5 days old. Blood drawn in PACOM is typed and cross matched at the 406th Medical Laboratory and again at the 9th Medical Laboratory in Vietnam, (Blood from CONUS is not rechecked by the 9th Medical Laboratory). The blood from Japan is about 2 to 3 days old when it arrives in Vietnam.

(2) Distribution of blood in country is directed by the USARV Central Blood Bank located at the 3d Field Hospital in Saigon. From there blood is flown to sub-depots located at Nha Trang, Long Binh, Qui Nhon, Pleiku and Da Nang. Sub-depots further distribute the blood to hospitals, divisions and separate brigades (clearing companies), a total of about 60 installations. It is interesting to note that shipments during the second half of the period have almost doubled those of the first half. The following table provides data on blood usage for the period of this report:

<u>MONTH</u>	<u>WHOLE BLOOD STATISTICS, JULY 1967 TO MAY 1968</u>					<u>UNITS PER</u>
	<u>BLOOD RECEIVED</u>	<u>BLOOD TRANSFUSED</u>	<u>BLOOD OUTDATED</u>	<u>BLOOD ON HAND</u>	<u>PNT</u>	<u>TRANSFUSED</u>
<u>1967</u>						
Jul	16,996	8,617	7,162	6,098		4.83
Aug	19,145	8,085	7,584	7,233		5.05
Sep	18,827	9,101	6,004	6,719		4.73
Oct	18,827	8,051	8,851	6,923		5.03
Nov	18,910	9,300	7,017	6,646		4.6
Dec	20,712	10,395	7,719	6,361		4.5

<u>MONTH</u>	<u>BLOOD RECEIVED</u>	<u>BLOOD TRANSFUSED</u>	<u>BLOOD OUTDATED</u>	<u>BLOOD ON HAND</u>	<u>UNITS PER PNT TRANSFUSED</u>
1968					
Jan	28,045	13,707	6,507	6,383	4.8
Feb	31,852	18,134	3,690	8,862	4.5
Mar	31,651	17,380	8,772	11,784	4.2
Apr	31,003	15,982	8,139	10,843	4.3
May	29,107	18,994	5,532	8,238	4.2

(3) Vivid evidence of the great increase in the tactical activity in Vietnam is reflected in the over 100 percent increase in blood usage from July 1967 to February 1968. The latter level of usage has continued. Analysis of data clearly reveals that the increase in blood usage was due to an increase in the number of severely wounded, because the average number of units transfused per patient did not significantly change during the entire period. In fact, there has been a tendency toward a slight decrease in blood usage per patient during the last three months. Although there appears to be a considerable number of units of blood which become outdated, this is not considered excessive. The percentage of units of blood outdated in Vietnam compares quite favorably with hospital experience in CONUS. Blood over 21 days old is not used by US Forces. Wherever possible this blood is given to ARVN and provincial hospitals who can use it until it is 31 days old.

(4) All US Force hospitals, except one, use type specific blood for transfusions. The 12th Evacuation Hospital at Cu Chi uses only type O positive low titer blood because of the large number of patients transfused. They feel it is safer for them under these circumstances to omit typing and cross matching of blood. Fresh blood is occasionally drawn and used in Vietnam; it is employed when a single patient has received a large number of units of bank blood. There are several reasons for not drawing fresh blood in Vietnam. They include (1) the danger of transmitting malaria or hepatitis, (2) the fact that everyone in Vietnam is in the combat area and subject to possible wounding. In recent months fresh frozen plasma has been used in increasing amounts as a substitute for fresh blood. This eliminates the necessity for the occasional use of fresh blood.

3. NEUROPSYCHIATRY

a. Psychiatry Practice in Divisions. The main emphasis of psychiatry in Vietnam was placed in the combat divisions. Fully trained psychiatrists were assigned to divisions; those partially trained were assigned to hospitals or psychiatric (KO) teams. All incoming psychiatrists were first sent to divisions for about 30 days to become acquainted with the needs of patients, and to assess their own ability to rehabilitate psychiatric patients. A feature of division psychiatry is the emphasis placed on the extensive use of enlisted social work specialists, who work as far forward as possible; they routinely see all patients and evaluate problems before the patient is seen by the psychiatrist or social work officer. These officers give their enlisted specialists extensive assistance and counseling. Many social and emotional problems have been handled by the enlisted specialists. Very few patients - an average of about three per month per division - required evacuation out of country for psychiatric reasons.

c. Neurology. About half of the neurology patients have headaches or syncope of such severity that they were beyond the capability of unit surgeons to manage. The volume of patients justified employment of two neurologists at Long Binh and one at Nha Trang. The lack of electroencephalographic capability of the Army has been a problem. Patients requiring an EEG must be sent to one of the two Navy hospital ships.

4. NURSING SERVICE

a. Strength. During the period of this report the ANC strength increased from 638 to 843 - a rate of 32 percent. However, there has been a requirement for 50 to 100 nurses over authorized strength to satisfy the need in units which have insufficient or no ANC authorizations. Insufficient authorization of nurses is primarily due to the fact that every hospital is operating far beyond its planned TOE professional capability and design. The solution to this problem will soon be solved by adjustment in MTOE.

b. Operating Room Nurses and Nurse Anesthetists. Despite the fact that the total number of nurses was adequate, there were serious shortages of operating room nurses and nurse anesthetists. There was a 50-percent shortage of these specialists. On-the-job training offered some relief. However, if the markedly increased casualty load of the past six months continues, there is a probability of a serious decrease in efficiency of surgical operative capabilities. Increase in the number of nurses enrolled in training programs for surgical nurses and nurse anesthetists may be a solution to this problem.

c. All Male Nurses in Forward Units. Two surgical hospitals (MUST) with all male nurses are employed in the Provisional Corps, Vietnam. The requirement for maximum mobility and operation under austere conditions led to the use of only male nurses in that area. Provision of suitable quarters and difficulty in obtaining real estate for facilities poses a problem in using female nurses. When living conditions improve and hospital sites are enlarged, it is contemplated that females will once again be assigned.

5. DENTAL SERVICE

a. Personnel. In Vietnam the ratio of dental officers to troops served differs from that in CONUS and other overseas areas. Congress established the ratio of dental officers to US Army personnel as 1 per 500. Dental officers serving in administrative positions, research, schools and other nonclinical assignments reduces this ratio to approximately 1 officer per 750 troops. The staffing ratio recommended for Vietnam by The Surgeon General is 1 officer per 1,450 troops. This ratio is adequate because both routine and elective dental treatment have relatively low priority in a combat zone because unit missions necessarily come first.

b. Organization.

(1) The concept of a Headquarters, Dental Professional Service (Team AI) has proven to be exceptionally sound. By having command and control of dental assets centralized in the 932d Medical Detachment area dental support is flexible and completely responsive to all requirements. However, because the scope of responsibilities is so great and the administrative workload so heavy, an administrative officer (MOS 3506) and an additional clerk typist (MOS 71B) are indicated. A MTOE reflecting the foregoing requirement has been submitted.

(2) The Dental Service Detachment (Team KJ) is the key area dental support unit and is used to great advantage in the type of war being fought in Vietnam. The idea is good but the TOE is deficient in enlisted personnel to adequately perform housekeeping and administrative functions in addition to those associated with patient care.

c. Patient Care

(1) Each division and each brigade (separate) has dental officers assigned. Divisions have four each and brigades have one. Organic dentists mainly provide emergency treatment which drastically reduces the time lost from the unit for the patient to be evacuated to the rear.

(2) A major breakthrough in preventive dentistry has been the initiation of mass applications of an anticariogenic agent. Using a self-applied stannous fluoride phosphate, soldiers can receive caries prevention treatments in groups of 20 to 30. This effort is expected to not only retard existing carious processes by 80%, but also to reduce the incidence of new carious lesions by 40%. Sufficient quantities of material have been requisitioned to provide preventive treatment to all incoming replacements. Future plans call for a program to provide this service twice yearly to all USARV personnel under the age of 25.

d. Materiel

(1) The dental equipment set, operating, field, which is basic to all TOE dental units and medical units with dental capabilities, has changed little in many years. The following specific comments concerning some needed improvements are submitted: drawers in chest function poorly; chair assembly shows little improvement over the World War II model; lights produce inadequate illumination; light stands are unstable and fragile; and expendable supplies should be updated in keeping with modern techniques.

(2) MUST Dental Units that were first introduced in Vietnam in April 1965 have been of little or no value to the dental service. The lack of repair parts and maintenance personnel has kept the sophisticated equipment inoperable much of the time. The MUST Dental Unit is an excellent concept in field dental treatment facilities but many modifications are a necessity.

e. The American soldier is receiving the best dental care ever provided in a combat situation. The scope of dental care runs the full gamut and every phase is provided as far forward as the tactical situation permits.

6. VETERINARY SERVICE

a. The veterinary service is responsible for subsistence inspections, care and treatment of military animals, zoonosis control programs and Veterinary Civic Action programs. Staff supervision is provided by the 44th Medical Brigade Veterinarian who also serves as the USARV Veterinarian.

b. During the last year USARV Veterinary personnel resources have increased from 24 officers and 82 EM to 59 officers and 265 EM. This augmentation was necessitated by an increase in subsistence inspection responsibilities and the deployment of additional dog units in Vietnam. The personnel requirements were satisfied by assigning Veterinary TOE Units to the 44th Medical Brigade. A Headquarters, Veterinary Professional Service Team (AF) has successfully exercised operational control over the eleven veterinary units assigned to the Brigade proving that this concept of control is sound.

c. Subsistence inspection problems experienced have usually been related to improper storage and management procedures. Excessive quantities received have exceeded the storage facilities available. The tropical environment of Vietnam is not conducive to long-term storage and items stored in open areas deteriorate at an accelerated rate. Corrosion of primary metal containers and weevil infestation of cereal products have constituted our major problems.

d. The failure to maintain adequate stock level records precluded the employment of prescribed methods for conducting surveillance inspections on a cyclic basis. Timely inspections and proper rotation of stocks could have prevented much of the losses incurred. Subsequent to an Army Audit Agency inspection, accountable officers were directed to provide veterinary inspectors with the data required for programming cyclic inspections.

e. The use of "Sea Land" shipments for perishable subsistence has reduced the deterioration incidences to a very low level. This method of shipment precludes detail inspections at the port. Adequate sampling can be accomplished only when the vans are delivered to the Depot or Class I storage points. This suggests that the veterinary positions organic to Terminal Commands should be reviewed.

f. Insanitary conditions and the use of nonpotable water preclude the approval of most local food establishments as a source of food and/or ice for the Armed Forces.

g. Heart worms, intestinal parasites and ticks represent the most common health problems for military dogs. Heat stroke has been responsible for a number of scout dog deaths. A contributing factor may be related to handlers giving the dogs salt. Instructions have been issued to units that salt tablets are not to be given to dogs. There was an incident where a scout dog platoon was poisoned when the veterinary technician failed to measure the insecticide used in a "Tick Dip."

h. The dog ration was a source of concern until recently. The dry product had weevils, the semi-moist was often moldy and at times no

horsemeat was available. To avoid changing a scout dog's feed when he is deployed, it is recommended that a new single product be developed that could be fed at all times.

i. Most animal sites are equipped with a small dispensary. Where we have a veterinary officer nearby this facility actually functions as a Modified Animal Dispensary Team IE. Likewise, the existing IE teams function as modified hospitals - Team ID. This concept is sound and advisable for the situation in Vietnam. To evacuate an animal requires evacuation of the handler. It makes more sense therefore to treat the animal at his kennel whenever possible.

j. Rabies continues to be a threat to our troops. Vaccination clinics and dog quarantine facilities are operational at most major installations. Misuse of the attenuated live virus vaccine necessitated the restriction on the issue and use of this product to veterinary officers.

k. The professional support provided to civic action programs has been recognized as a valuable asset to our objectives. With the recent increase in personnel resources the effort in this area is being enhanced.

IRHA USARV HOSPITALS

REGION OF INJURY

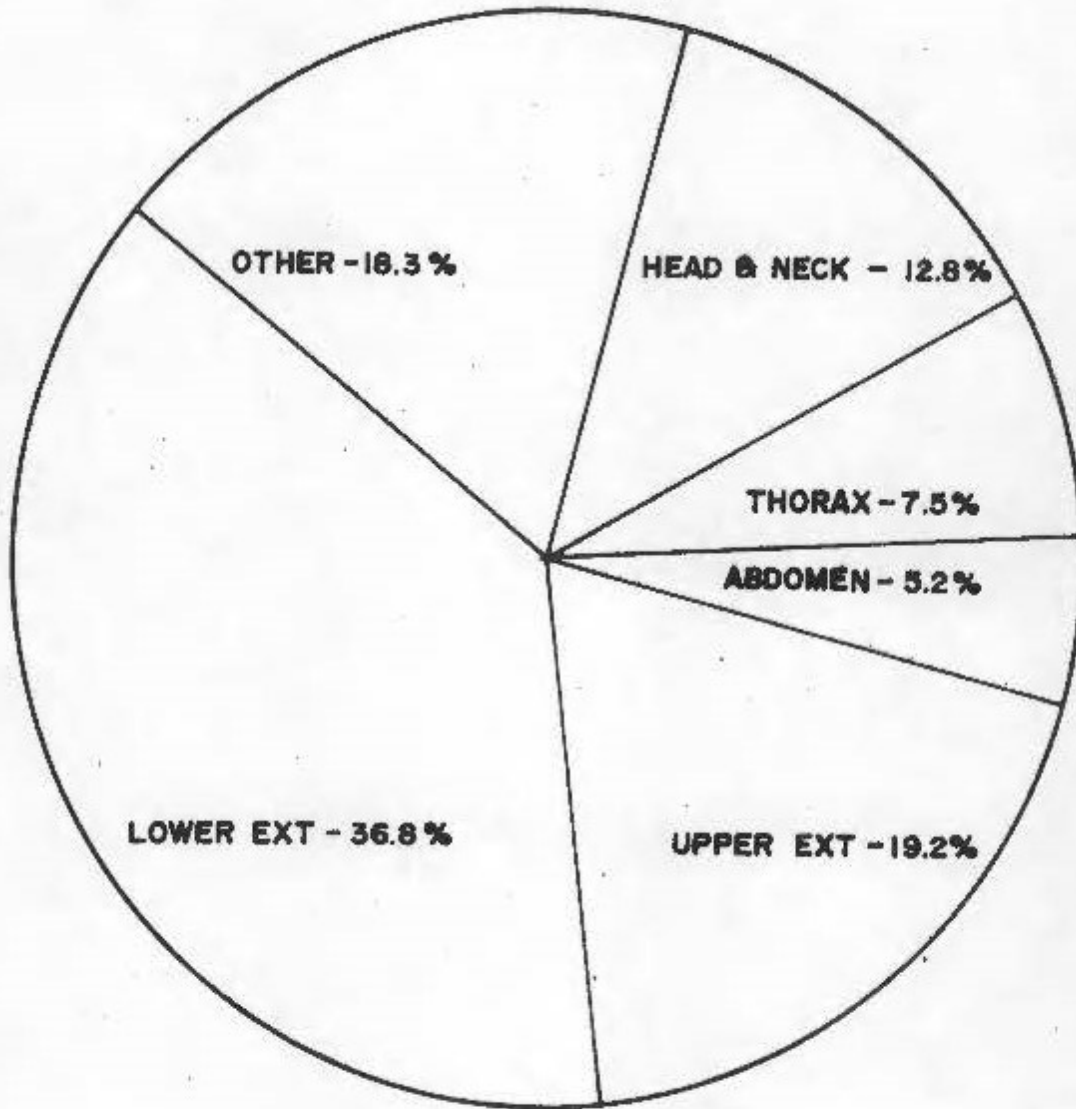


FIGURE 1

ANNEX E

IRHA USARV HOSPITALS

% OF DEATHS BY REGION OF INJURY

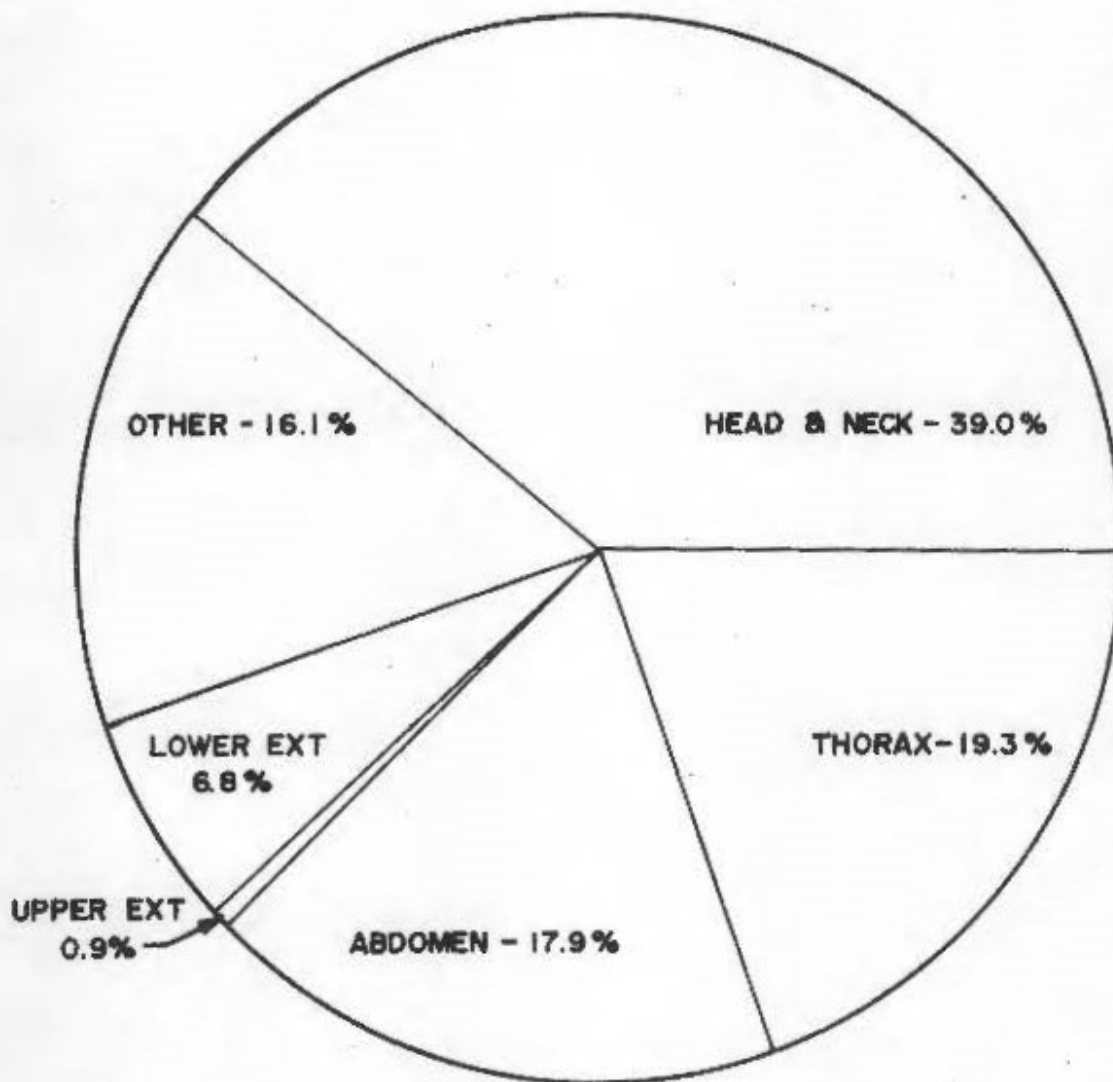


FIGURE 2

ANNEX E

MORTAL & RECOVERABLE WOUNDS (IRHA)

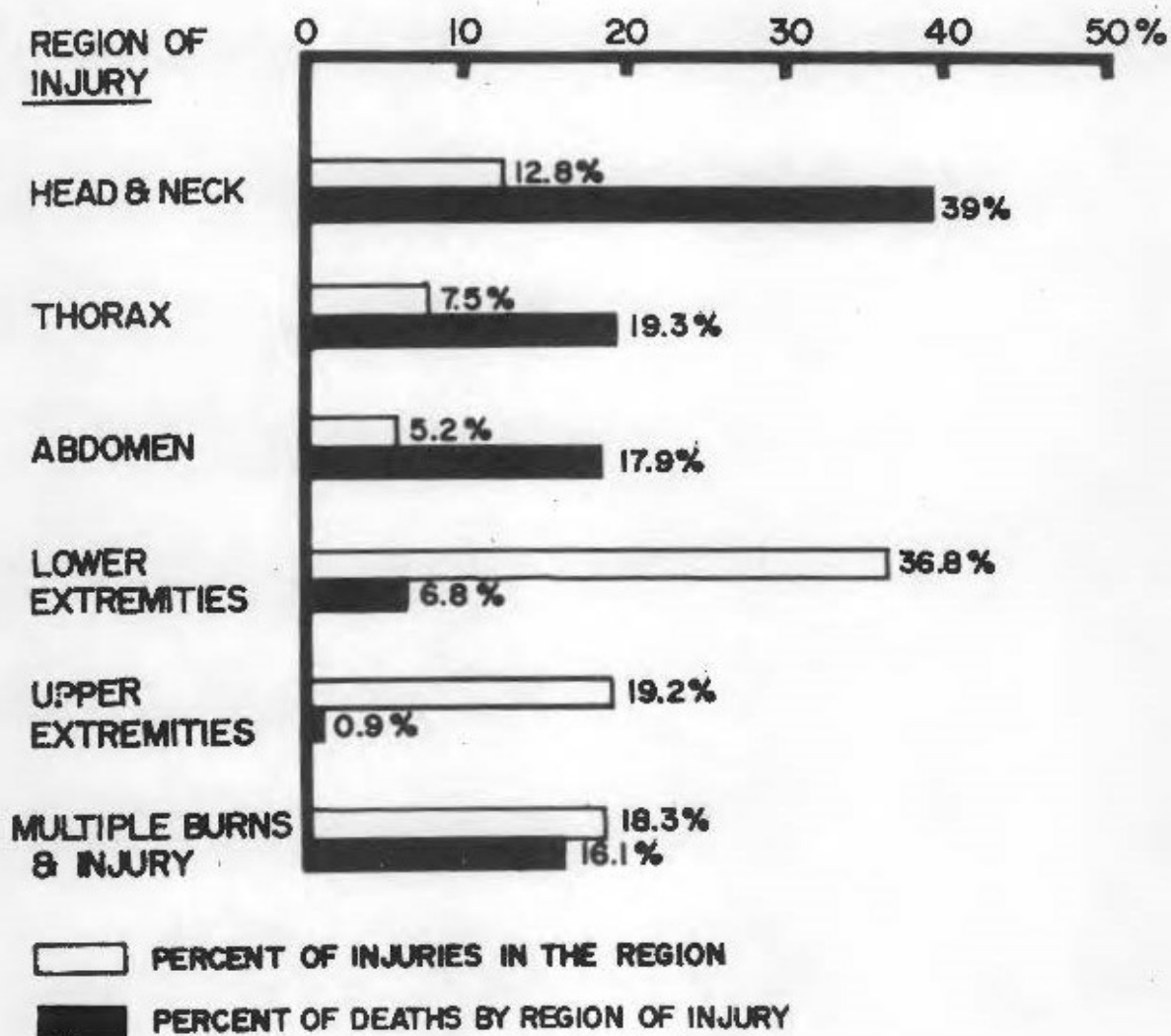
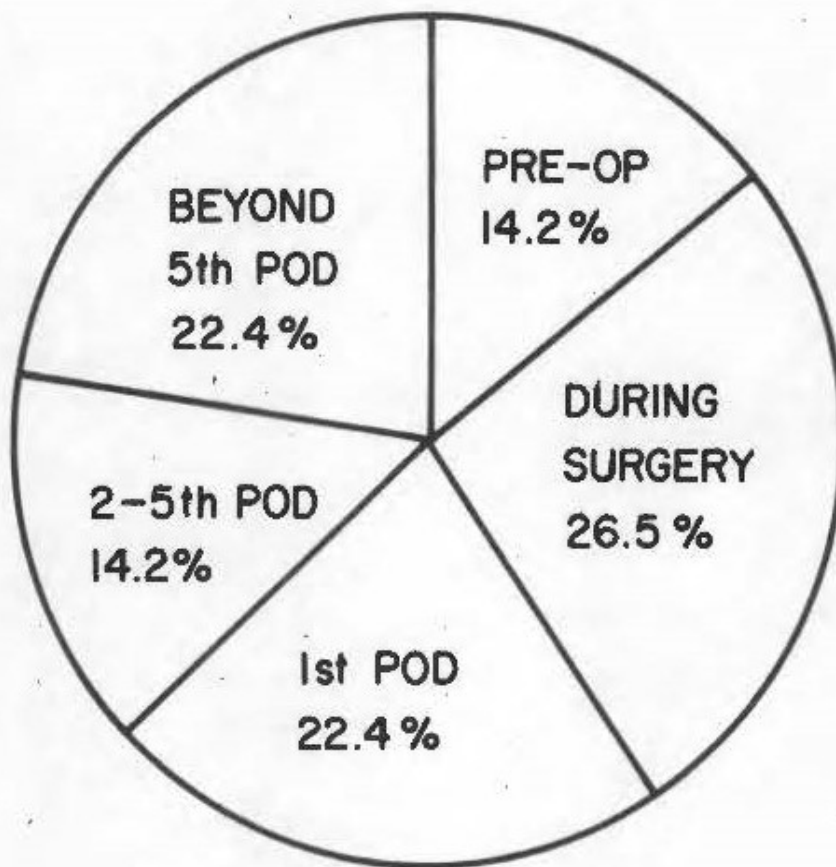


FIGURE 3

ANNEX E

TIME OF DEATH IN SURGICAL PATIENTS

147 CASES*



* HEAD INJURIES EXCLUDED

FIGURE 4

ANNEX E

DISPOSITIONS IRHA

JAN 65—JAN 68

33,930 CASES

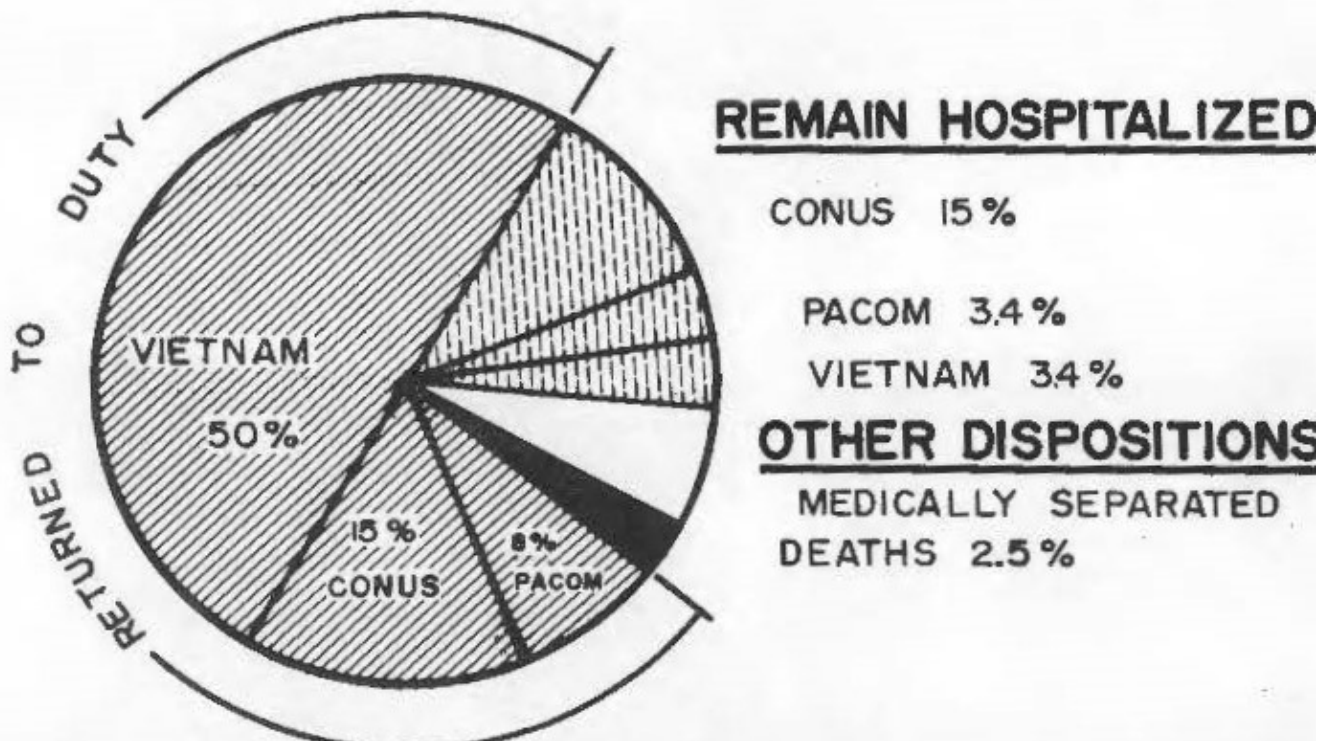


FIGURE 5

ANNEX E

KIA : WIA* RATIO

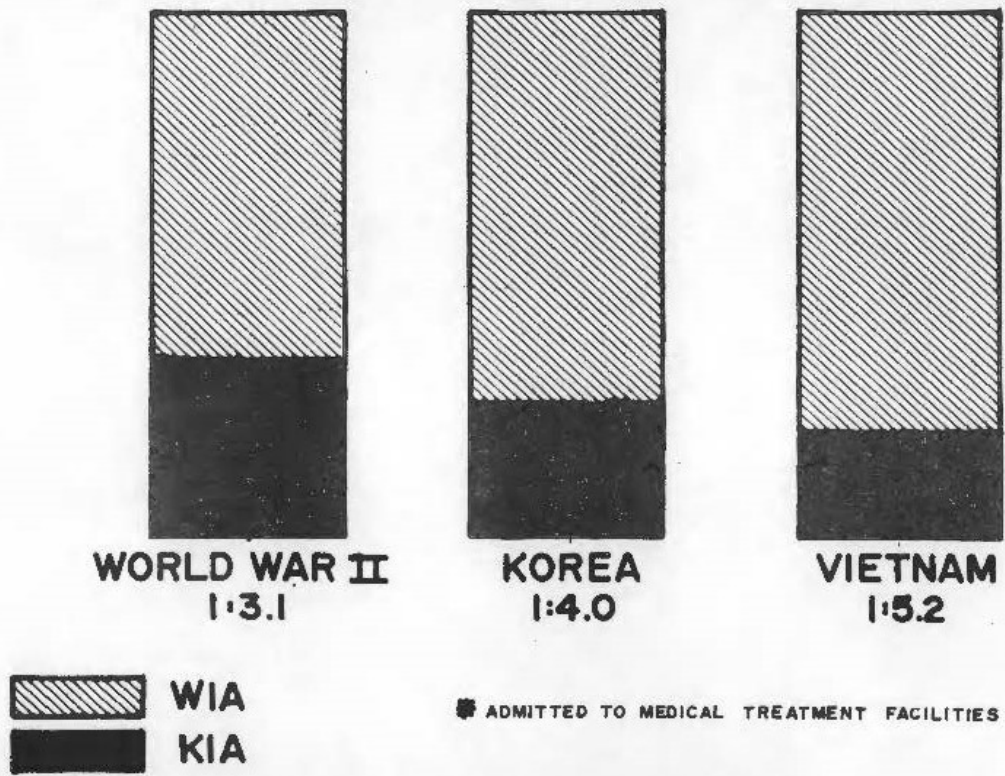


FIGURE 6

ANNEX E

CASUALTY ADMISSION RATES PER 1,000 TROOPS PER YEAR

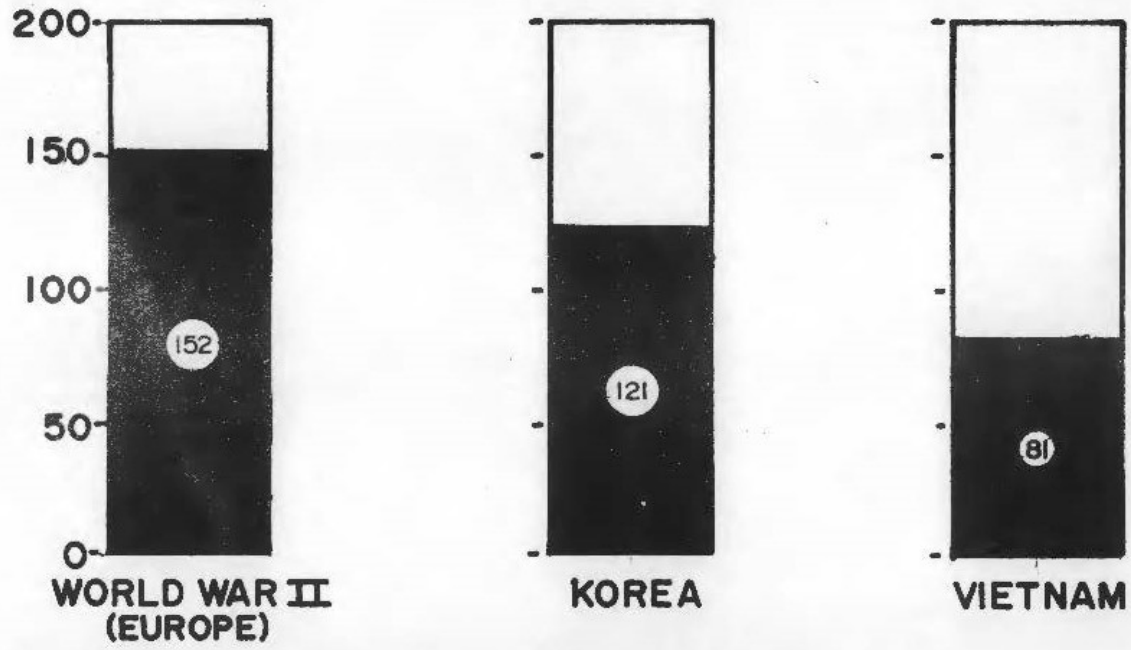


FIGURE 7

ANNEX E

ANNEX F

MEDICAL MATERIEL

1. GENERAL. USARV has the responsibility for medical supply support of the US Army in Vietnam. US Navy and Free World Military Assistance Forces (FWMAF) located in II, III and IV CTZs are also supported by USARV. The 32d Medical Depot operates the depot and central inventory management system which accomplishes the medical supply support mission. This unit, with six locations throughout Vietnam, has issued approximately \$30 million of medical materiel during FY 68 to Army and other supported units in RVN.
2. STAFF SUPERVISION. Staff supervision of medical materiel management was vested in the ACofS, G4, HQ USARV, prior to August 1967. On 25 August 1967 the function was transferred to the Office of the Surgeon, USARV, without personnel spaces. A total of 12 spaces were justified for this function during January 1968; however, a shortage of manpower in HQ USARV has precluded the allocation of spaces. In the interim, the function has been accomplished by two officers. Although adequate personnel spaces have not been available, medical materiel management has been improved by integrating and correlating the materiel function with other essential functions of the Surgeon.
3. THE 44TH MEDICAL BRIGADE. The 44th Medical Brigade commands and controls all hospitals and other Army level medical units in RVN. Staff supervision of the medical materiel function is vested in the brigade to improve medical materiel management and supply support effectiveness. All hospitals are now authorized a 45-day stockage objective. Mass casualty levels are also authorized to provide essential supplies necessary for the treatment of casualties incident to intense combat. The presently authorized levels now permit hospitals to meet supply requirements with a high percentage of fill and a minimum number of emergency requisitions. Other significant improvements made during the year are: the establishment of field and evacuation hospitals as retail supply points for small units and dispensaries; the introduction of a standard supply accounting procedure for all hospitals; the publication of recurring medical supply information letters; the development of a system for authorizing additional technical medical equipment required to enhance the hospitals' medical professional capability; the establishment of better procedures for control and submission of requisitions; and the institution of quarterly command inspections and supply conferences.
4. MEDICAL TECHNICAL EQUIPMENT. Based upon authority granted by the Department of the Army and CINCUSARPAC, this headquarters is authorized to approve the issue of medical technical equipment in excess of TOE. As a result, a continuous, progressive program has been implemented to insure hospitals and other medical units are equipped with sophisticated medical technical items required for the resuscitation and stabilization of combat casualties and the practice of modern medicine. The new anesthesia equipment and the suction and pressure apparatus have been distributed throughout Vietnam. Over \$300 thousand of sophisticated laboratory equipment has been procured and delivered to the 9th Medical Laboratory during the past year.

5. DEPOT OPERATIONS.

a. The 32d Medical Depot, with headquarters and base platoon at Cam Ranh Bay, has continued to expand and improve its operational efficiency during the past year. Two new advanced platoons have been established. These units are the 507th Medical Supply Detachment at Chu Lai, which supports units in Da Nang and Chu Lai areas, and the 4th Advanced Platoon (Provisional) at Phu Bai, which supports units located north of Da Nang in I CTZ. Other advance platoons are located at Qui Nhon and Long Binh, while the reserve storage warehouse, base optical and maintenance shops are located at Nha Trang.

b. A continuous effort has been made to improve stock control and inventory management at the base depot and advanced platoons. As a part of this program NCR 500 computer systems have been installed at the Base and 1st Advance Platoons. Three additional computers will be installed at Qui Nhon, Chu Lai and Phu Bai by 30 September 1968. Computerization of the central inventory management function has started using an IBM 360/20 on a service contract with the IBM Saigon Service Center. Analysts and programmers from the Computer Science Corporation are assisting in this project.

c. The 1st Advanced Platoon completed the relocation from Saigon to Tan Son Nhut to Long Binh during September 1968. This supply point and the 507th Medical Supply Detachment now have sufficient warehouse space. Additional space is required at Cam Ranh Bay, Qui Nhon and Phu Bai. Action has been taken to include the requirements in the FY 68 and FY 69 Construction Programs.

d. Single vision optical fabrication capability is now available at all platoons. Monthly production has increased from a low of 3,485 to a high of 16,521 spectacles manufactured per month in RVN. Spectacle prescriptions forwarded by the depot to Okinawa for fabrication have been reduced from a high of 6,173 in October 1967 to a low of 803 in March 1968. A total of 110,600 spectacles were fabricated in RVN during FY 68.

e. Medical maintenance shops are also operated in all platoons. The total work orders processed in RVN during FY 68 were 4,194, while 521 items of equipment were shipped to Okinawa for repair. During the 3d Quarter of FY 68, a Maintenance Quick Reaction Team visited each major medical unit in the command to evaluate the maintenance system and propose methods for improving the repair and return of technical medical equipment.

f. At the beginning of FY 68 the authorized depot strength was insufficient to meet the mission requirements. The total authorized strength was 218, while only 186 personnel were assigned. The authorized strength was increased to 251 by the deployment of one medical supply detachment (TOE 8-500, FC) during the fall of 1967. The authorized strength should reach 350 during the 1st Quarter, FY 69. This 40% increase in strength will occur when the MTOE, submitted during 1d Quarters [sic], FY 68, is approved and units programmed for deployment arrive in RVN. Total actual strength has steadily increased throughout the year from a low of 186 in August 1967 to a high of 333 during April 1968.

g. The demand for medical materiel has continued to increase throughout the year. During the 1st Quarter, FY 68, the average monthly issues to hospitals and other units were 482 short tons. By the 3d Quarter, FY 68, average monthly issues had increased to 931 short tons, excluding materiel shipped directly from Okinawa to hospitals. This increase in demand was due principally to the deployment of Army units in I CTZ and increased combat intensity subsequent to 1 February 1968. In spite of the increased requirements, hospitals have continued to support their customer in a highly effective manner. The average percentage of fill for all hospitals in RVN increased from 74% during September 1967 to 85% in December 1967. During the past six months, the percentage of fill has ranged from a low of 83% to a high of 88%. This high degree of customer satisfaction is directly attributed to the levels of supply established at hospitals and resupply support provided by the 32d Medical Depot.

6. AUTOMATIC RESUPPLY IN I CTZ. During the 2d Quarter, FY 68, elements of the 1st Cavalry Division, Air Mobile, were deployed north from the base camp area to the vicinity of Chu Lai. At this time the Division Medical Supply Officer developed a list of medical materiel required to support one brigade by automatic resupply from the Base Depot at Cam Ranh Bay. This system provided rapid, effective resupply for the 1st Cavalry Division regardless of location. As elements of the 1st Cavalry and 101st Airborne Divisions, together with hospitals, were scheduled for deployment to I CTZ during the 3d Quarter, FY 68, it became obvious that automatic resupply support must be provided pending the establishment of a depot in I CTZ. It also became clear that the Base Depot at Cam Ranh Bay did not have the stock or personnel resources to assemble the number of resupply packs required. Therefore, the 32d Medical Depot continued to support the two divisions with automatic resupply packs shipped from Cam Ranh Bay and Long Binh. All other automatic resupply requirements were placed on the US Army Medical Depot Activity, Ryuku Islands. Planning for this operation occurred just before the VC-NVA Tet offensive which started on 31 January 1968. The large demands for medical materiel during and subsequent to Tet clearly demonstrated the wisdom of utilizing medical stocks positioned in Okinawa for resupply units in I CTZ. A total of 11 shipments were made directly from Okinawa to three hospitals in I CTZ, the 18th Surgical located at Quang Tri, the 22d Surgical at Phu Bai and the 95th Evacuation at Da Nang. These packs contained 15 to 30 days of stock based upon actual demand from comparable hospitals operating in RVN. The 4th Advance Platoon (Provisional), Phu Bai, was stocked with an initial level of 45 days of supply and three 15-day resupply shipments from Okinawa. Shipments were normally received on or shortly after the required date, and 90 to 95% of the item requirements were satisfied. As in previous wars, this system again proved to be reliable and effective for combat resupply purposes [sic]. For this reason the system has also been used to satisfy the initial requirements for both the 27th Surgical and 29th Evacuation Hospitals, located at Chu Lai and Can Tho respectively.

7 MAINTENANCE SUPPORT OF MUST HOSPITALS

a. The first MUST Surgical Hospital was deployed to RVN during 1966. MUST equipment for the second hospital was shipped during May 1967. During

FY 67, maintenance support of the MUST hospitals was accomplished by the Army Surgeon General's Office utilizing parts procured under the research contract and Garrett Corporation technical personnel. Supervision was provided by the MUST Project Officer, a maintenance trained Medical Service Corps officer. On 1 July 1967, responsibility for maintenance parts support was transferred to the US Army Mobility Equipment Command. The TOE of the 32d Medical Depot was modified to include one warrant officer and 17 enlisted men. These personnel are principally engineer maintenance personnel with training in turbine engines, refrigeration and MUST utility elements.

b. The Maintenance Support Program initially included 14 utility elements located at both Army and Marine hospitals in RVN. By 1 August 1967 the MUST Maintenance Section had been established at the 1st Platoon of the 32d Medical Depot, Long Binh. Parts stored at the 3d and 45th Surgical Hospitals were moved to Long Binh, and additional parts were requisitioned from USAMECOM. During the fall 1967 equipment for two additional surgical hospitals was deployed to RVN, and a small reserve of equipment was shipped from the CONUS during the 3d Quarter, FY 68. By 30 June 1968 a total of 28 utility elements were on hand in RVN to provide power for Marine and Army hospitals. Thus, the MUST Maintenance Program was increased 100% during the year.

c. Shipment of MUST hospitals or components to RVN was absolutely essential to provide a readily transportable hospital facility for close-in support of combat units deployed to I CTZ. Yet the large scale utilization of MUST components for the first time under combat conditions created a number of serious problems. First, a continuous shortage of MUST trained power pack operators and maintenance personnel has existed throughout the year. Second, realistic requirements for repair parts were difficult to determine due to lack of experience factors. Third, supply of parts was often unsatisfactory due to the procurement lead time required for purchase of parts. In fact, emergency action was often required to procure parts essential for continuous operation of hospitals. Finally, lack of high mortality parts precluded the establishment of a scheduled overhaul program to insure trouble-free performance between overhaul periods. Nevertheless, the MUST hospitals have never become inoperable for lack of parts or maintenance, and the hospitals have provided invaluable facilities for support of combat operations in remote locations where other facilities are not available. Hospitals, as a result of air conditioning and sealed inclosures, provide aseptic operating pavilions and superior patient care facilities. They are far superior to World War II tent hospitals.

d. Experience gained in the utilization of MUST hospitals should help to improve the design and operation of future MUST hospitals. There are many examples of the lessons learned from the use of MUST hospitals during the past year. First, adequate fuel and water storage equipment must be included in the TOE of these hospitals. Second, preparation of sites for inflatable and expandable elements is not always possible. Therefore, light weight prefabricated floors should be developed. Wooden floors have been fabricated in RVN, but they are heavy and difficult to transport. Third, prefabricated shelves are needed for the storage of supplies and

equipment. Fourth, the hospital beds are fragile and should be redesigned. Fifth, the inflatable shelters are extremely vulnerable to enemy attack and require extensive replacement of inner tubes when hit with shell fragments. This means a prefabricated ward, which can be readily repaired, should be developed. Finally, the consumption of large amounts of fuel is a constant logistics problem. For instance, one surgical hospital requires approximately 3,000 gallons of JP4 per day. This is approximately 12 tons of fuel per day which may be an excessive requirement in remote areas.

e. In spite of the initial operational and maintenance difficulties, the MUST elements possess a great potential for future use, especially for small hospitals, clearing stations and the augmentation of larger tent hospitals with surgical suites and intensive care facilities. The MUST hospital facilities should not be considered as an acceptable substitute for fixed or semifixed hospitals when sufficient construction resources are available.

ANNEX G

MEDICAL RECORDS AND STATISTICS

1. OBJECTIVES. The Medical Records and Statistical Division of the USARV Surgeon's Office operates a central medical records and statistics agency for the command. It serves as a clearing house for all statistical data and medical records information. This division provides guidance to all units in the preparation of medical records, medical reports and other matters pertaining to patient administration. Medical data are collected, tabulated and analyzed. These data serve to provide measures of the quantity and quality of medical care provided and they are also used as a tool in planning and for research. Data provided in this annex includes that data available through May, 1968. This was done since June data would not be available in sufficient time to allow inclusion.

2. ADMISSION DATA

a. A compilation of data on total admissions to all medical facilities and hospitals is shown at Figure 1. Due to the variance in the character and intensity of the tactical situation between the first 6-month and second 5-month periods of this report, this information is shown separately. Data on the 6-month period prior to the report is included for comparative purposes. The most significant data is the marked increase in Injured as a Result of Hostile Action (IRHA) cases admitted in the period from January to May 1968, when compared to that of the previous two periods. This illustrates the high intensity of combat during the Tet offensive and in the months that followed. Another point of interest is the marked decrease in total disease and non-battle injuries for the same period. While the total IRHA rate for the period of January to May 1968 was greater than that for the entire previous year, the US Army IRHA did not increase to quite the same degree. The marked increase in total IRHA reflects the significant increase in admissions of civilian war casualties, Prisoner of War (POW) and RVN military patients in the second half of the report period.

b. Admissions to Army facilities. Figure 2 illustrates the monthly admission experience for the past year and a half. There has been a steady increase in the numbers of IRHA admissions in the past year. Disease admissions seem to follow a cyclic trend with lows in February to peaks in July and October. There is no apparent significant change in Non Battle Injury (NBI) admissions. Backup statistical data is included at Figure 3 and Figure 4. These show the number of Army admissions to all medical facilities and the admission data of the Army level medical facilities of the 44th Medical Brigade.

3. AVERAGE NUMBER OF BEDS OPERATIONAL AND OCCUPIED. Figure 5 reflects the increase in the number of operational beds during the past year and a half. Except for minor peaks in July and November 1967, there was a gradual increase in occupied beds. It is noteworthy that the prescribed 65-percent level of bed occupancy was not exceeded in any month. This is

a tribute to the effectiveness of the medical regulating system of the 44th Medical Brigade. Figure 6 is a compilation of statistical data by month for the past year and a half on average daily hospital census.

4. ARMY PATIENTS IN USARV HOSPITALS. Figure 7 shows the general trend towards a small reduction in the percentage of US Army patients in USARV hospitals. It is important to note, while observing this trend, that the actual number of US Army patients increased during the period shown. There was a small but significant increase in the percentage of other than US Army patients. These included civilian war casualties, POW and RVN military patients. Most of these patients were admitted during the Tet offensive in February and March, 1968. It is expected that this "other" category of patients will remain as a significant proportion of the total number of patients in USARV hospitals because of the Civilian War Casualty Program and MEDCAP activities. A statistical listing of patients in USARV hospitals is found at Figure 8.

5. CONVALESCENT CENTER OCCUPANCY. Figure 9 gives the average daily census and occupancy rates of the 6th Convalescent Center which varied throughout the past year and a half. The highest occupancy rate was in July 1967 -98%. The lowest rates were in January and February of 1968 - 51% and 58%, respectively. These low rates were partially due to difficulties in obtaining transportation to the Center during the Tet offensive and because the malaria rates were relatively low during these months.

6. US ARMY IRHA DISPOSITION. Figure 10 depicts the number and disposition of US Army wounded in Vietnam. It is of interest to note that several thousand wounded were not admitted to any treatment facility. (Total IRHA figures were obtained from USARV AG Casualty data). Two-thirds of IRHA patients were returned to duty in Vietnam. The major portion of the other third was evacuated to Japan and the remainder directly to CONUS.

7. BATTLE CASUALTIES. Figure 11 completes the statistical picture of battle casualties by reflecting the data on wounded and killed in action during the past year and a half. The ratio of those killed to those wounded in Vietnam compares favorably to that of any recent conflict. This ratio varied from 1 killed to 8 wounded in August 1967 to 1 killed to 5 wounded during October and November 1967. Heavy fighting in and around Dak To contributed to the latter figures. The ratio of 1 to 6 prevailed generally for the past year.

ADMISSION DATA

	JAN-JUN 1967	JUL-DEC 1967	JAN-MAY 1968
Total Patients Admitted to All USARV Medical Facilities	78,958	91,366	91,111
Total US Army Patients Admitted to All USARV Medical Facilities	71,616	81,283	76,878
Total IRHA Admitted to All USARV Medical Facilities	14,650	15,397	32,767
Total US Army IRHA Admitted to All USARV Medical Facilities	13,079	11,915	24,278
Total Admissions to USARV Hospitals	45,458	49,957	47,825
Total US Army Patients Admitted to USARV Hospitals	38,923	39,838	31,441
Total US Army Disease and Non- battle Injury Admitted to USARV Hospitals	29,008	30,988	16,845
Total US Army IRHA Admitted to USARV Hospitals	9,915	8,850	14,596

FIGURE 1

ANNEX G

ADMISSIONS TO ARMY FACILITIES

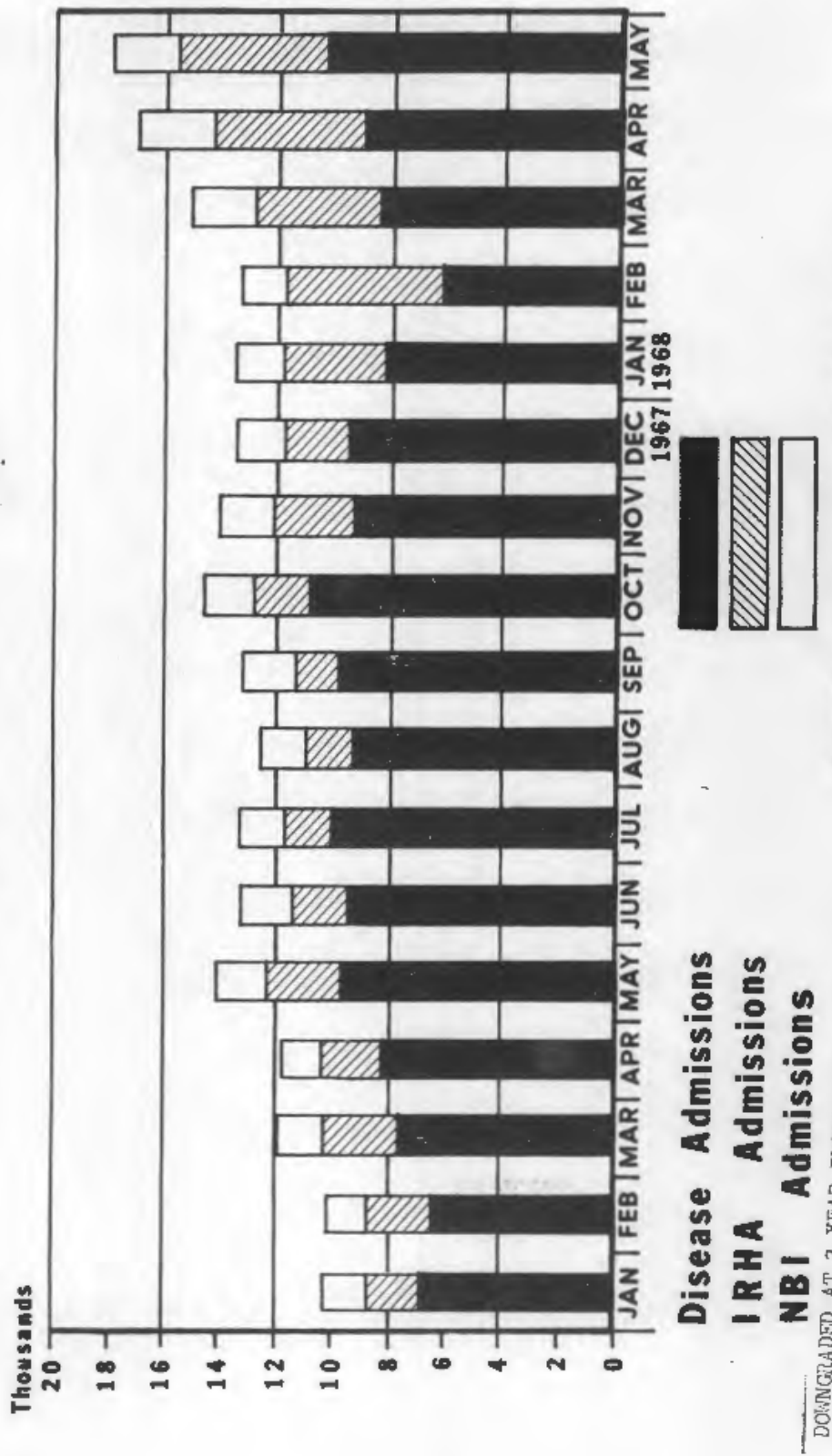


FIGURE 2

TOTAL NUMBER OF ARMY ADMISSIONS - ALL FACILITIES

1967

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ALL CAUSES	10215	10248	11895	11820	14155	13283	13357	12529	13219	14720	14065	13393
DISEASE	7025	6467	7676	8368	9681	9600	9935	9273	9713	10843	9363	9470
NBI	1531	1442	1734	1598	1739	1676	1600	1600	1766	1991	1960	1854
IRHA	1659	2339	2485	1854	2735	2007	1822	1656	1740	1886	2742	2069

1968

	JAN	FEB	MAR	APR	MAY
ALL CAUSES	13656	13305	15186	16768	17963
DISEASE	8217	6394	8442	8989	10298
NBI	1874	1598	2247	2354	2187
IRHA	3565	5313	4497	5425	5478

FIGURE 3

ANNEX G

*44TH MEDICAL BRIGADE STATISTICS - JULY 1967 THROUGH MAY 1968

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
TOTAL ADMISSIONS	8331	9885	8600	9641	9987	9318	9747	9978	9037	9908	12665
IRHA	1646	1419	1317	1503	2194	1790	3563	4996	3866	3752	5715
DISEASE AND NBI	6685	8466	7283	8138	7793	7528	6184	4982	5171	6156	6950
TOTAL DISPOSITIONS	8941	9111	8346	9309	10042	9351	9384	10304	8527	9727	12508
RETURNED TO DUTY	7226	7490	6785	7341	7453	7038	6771	6458	5840	6747	8285
EVAC OUT OF COUNTRY	1595	1521	1431	1851	2435	2152	2417	3576	2471	2782	3952
HOSPITAL DEATHS	120	100	130	117	154	161	196	270	216	198	271

*These data are inclusive of all Army, Navy, Marine and Air Force patients evacuated. There are also Korean patients evacuated to the Philippines and Korea in these data.

NOTE: This chart includes only Army level Medical Service statistics

FIGURE 4
ANNEX G

AVERAGE NUMBER OF BEDS OPERATIONAL AND OCCUPIED (average for month)

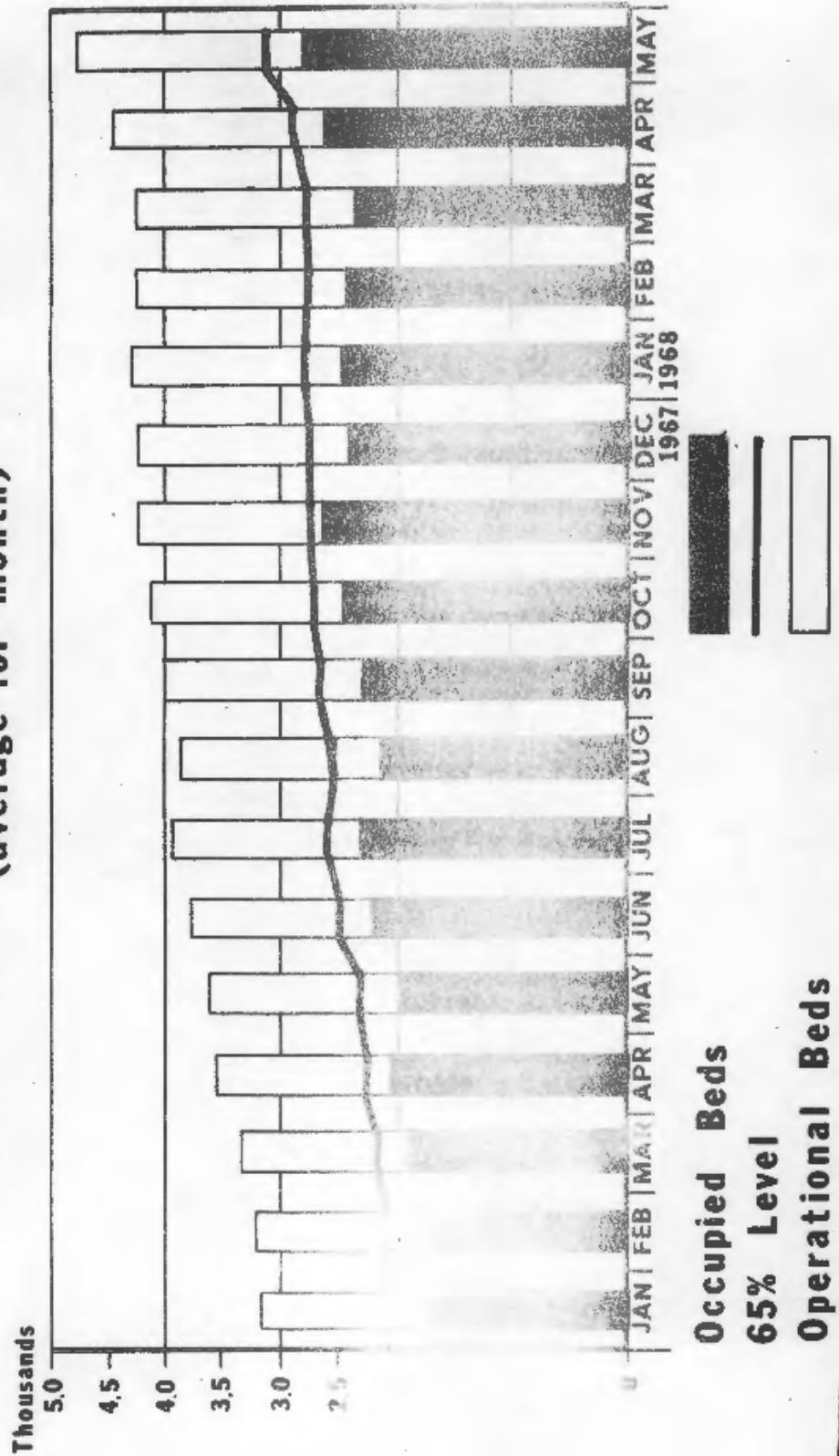


FIGURE 5
ANNEX G

1967 AVERAGE DAILY HOSPITAL CENSUS BY MONTH

MONTH	ARMY	OTHER US MILITARY	OTHER PERSONNEL	TOTAL	BEDS OPERATIONAL	% BEDS OCCUPIED
JAN	1512	63	214	1790	3148	56.86
FEB	1486	71	207	1764	3163	55.77
MAR	1590	60	285	1935	3328	58.14
APR	1659	57	315	2031	3526	57.60
MAY	1645	59	299	2003	3608	55.51
JUN	1752	75	373	2200	3808	57.78
AVG JAN-JUN	1607	64	282	1953	3430	56.94
JUL	1804	79	422	2305	3948	58.38
AUG	1653	74	444	2171	3880	55.95
SEP	1727	72	481	2280	4090	55.75
OCT	1925	76	459	2460	4141	59.40
NOV	2094	78	467	2639	4235	62.31
DEC	1800	74	513	2387	4245	56.23
AVG JUL-DEC	1834	76	464	2374	4089	58.05

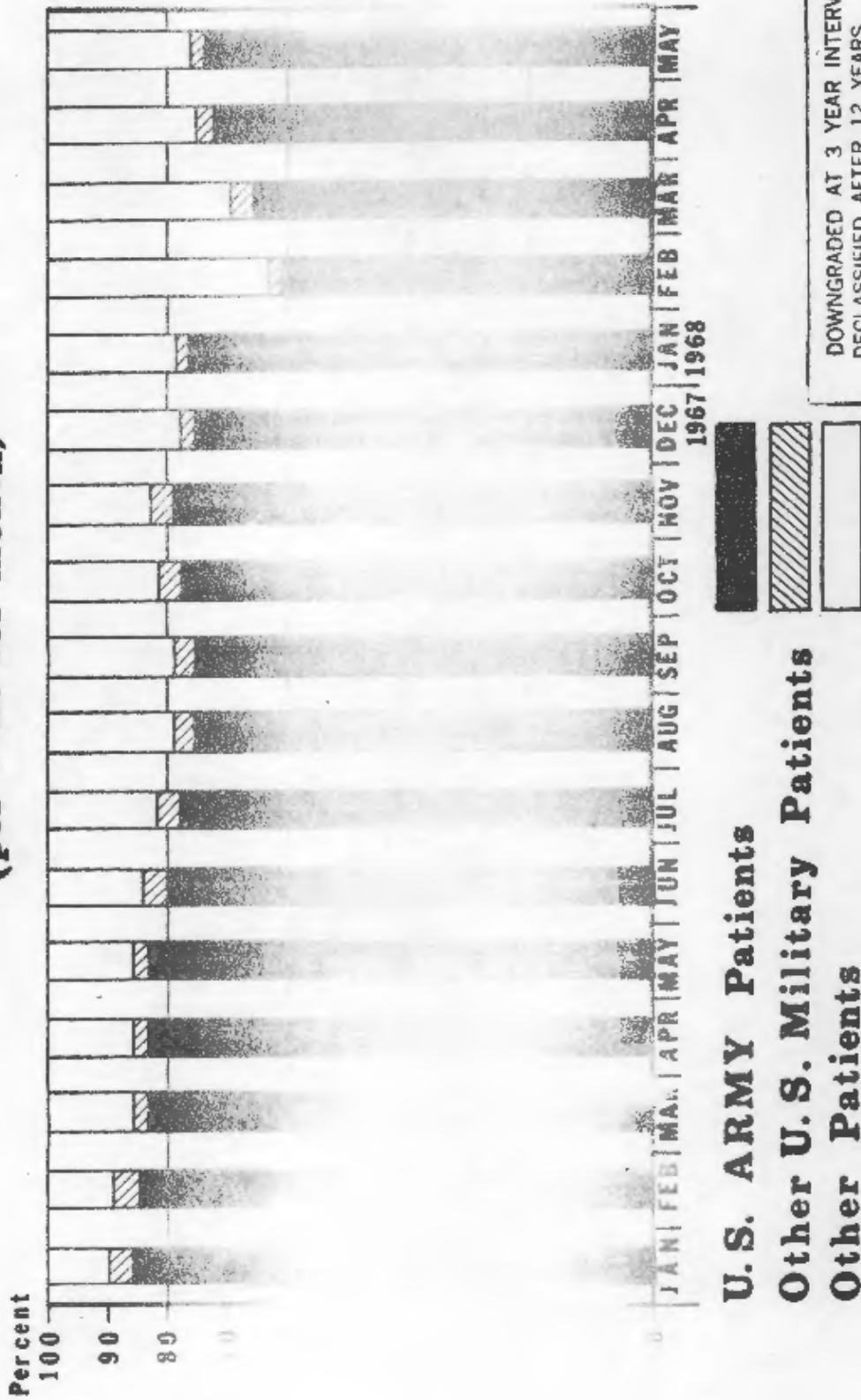
1968 AVERAGE DAILY HOSPITAL CENSUS BY MONTH
AND AVERAGE FOR PERIOD 1 JAN - 31 MAY 68

MO.	ARMY	OTHER US MILITARY	ALLIED AF (ARVN MIL)	OTHER PERS (VIET CIV)	TOTAL	BEDS OPNL	PERCENT OCCUPIED
JAN	1867	56	107 (81)	421 (241)	2451	4305	56.9
FEB	1480	52	151 (128)	740 (530)	2423	4350	55.7
MAR	1599	69	113 (103)	578 (458)	2359	4265	55.3
APR	1852	84	107 (99)	540 (442)	2583	4525	57.0
MAY	2026	75	129 (105)	585 (454)	2815	4905	57.3
AVG	1765	67	121 (103)	573 (425)	2526	4470	56.5

FIGURE 6

ARMY PATIENTS IN USARV HOSPITALS

(per cent for month)



DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.

FIGURE 7
ANNEX G

DISTRIBUTION OF PATIENTS CENSUS BY CATEGORY

IN USARV HOSPITALS, 1 JAN - 31 DEC 67

MO.	ARMY	OTHER US MILITARY	OTHER PERSONNEL
JAN	85%	4%	11%
FEB	84%	4%	12%
MAR	82%	3%	15%
APR	82%	3%	15%
MAY	82%	3%	15%
JUN	80%	3%	17%
JUL	78%	3%	19%
AUG	76%	3%	21%
SEP	76%	3%	21%
OCT	78%	3%	19%
NOV	79%	3%	18%
DEC	75%	3%	22%

DISTRIBUTION OF PATIENTS CENSUS BY CATEGORY

IN USARV HOSPITALS, 1 JAN - 31 MAY 68

MO.	ARMY	OTHER US MILITARY	ALLIED MILITARY	OTHER PERSONNEL	TOTAL
JAN	75.8%	2.6%	4.4%	17.2%	100%
FEB	61.2%	2.1%	6.2%	30.5%	100%
MAR	67.4%	2.9%	4.9%	24.8%	100%
APR	71.7%	3.3%	4.1%	20.9%	100%
MAY	71.7%	2.9%	4.6%	20.8%	100%

FIGURE 8

ANNEX G

AVERAGE DAILY CENSUS AND OCCUPANCY RATE
 6TH CONVALESCENT CENTER, 1 JAN - 31 DEC 67

MO.	AVERAGE CENSUS	% OCCUPIED
JAN	730	73
FEB	598	60
MAR	799	80
APR	860	86
MAY	1078	90
JUN	1149	96
JUL	1174	98
AUG	1069	82
SEP	895	69
OCT	966	74
NOV	1056	81
DEC	819	63

AVERAGE DAILY CENSUS AND OCCUPANCY RATE
 6TH CONVALESCENT CENTER, 1 JAN - 31 MAY 68

MO.	AVERAGE CENSUS	% OCCUPIED
JAN	663	51
FEB	754	58
MAR	962	74
APR	1095	84
MAY	1131	87

FIGURE 9

ANNEX G

US ARMY IRHA DISPOSITION

JULY 1967 TO MAY 1968

Total US Army IRHA	39,353
Total US Army IRHA Admitted to All USARV Medical Facilities	36,193
Total US Army IRHA Admitted to USARV Hospitals	23,446
Died in USARV Hospitals	671*
Total US Army IRHA Evacuated to US Army Medical Command, Japan	13,103
Total US Army IRHA Returned to Duty in RVN	25,679 (66%)

*Percent That Died:

1.7 of Total IRHA

1.9 of IRHA Admitted to USARV Medical Facilities

2.9 of IRHA Admitted to USARV Hospitals

FIGURE 10

ANNEX G

IRHA AND KHA, JAN 67 - MAY 68

	PERIOD	IRHA	KHA
<u>1967</u>	1 - 31 JAN	2044	331
	1 - 28 FEB	2568	411
	1 - 31 MAR	3682	563
	1 - 30 APR	2935	369
	1 - 31 MAY	3706	528
	1 - 30 JUN	2882	485
	1 - 31 JUL	2598	355
	1 - 31 AUG	2127	266
	1 - 30 SEP	2262	311
	1 - 31 OCT	2614	476
	1 - 30 NOV	3596	669
	1 - 31 DEC	3505	509
<u>1968</u>	1 - 31 JAN	4339	668
	1 - 29 FEB	7362	1295
	1 - 31 MAR	7139	1155
	1 - 30 APR	6386	866
	1 - 31 MAY	8496	1336

FIGURE 11

ANNEX G