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DISEASE AND INJURY

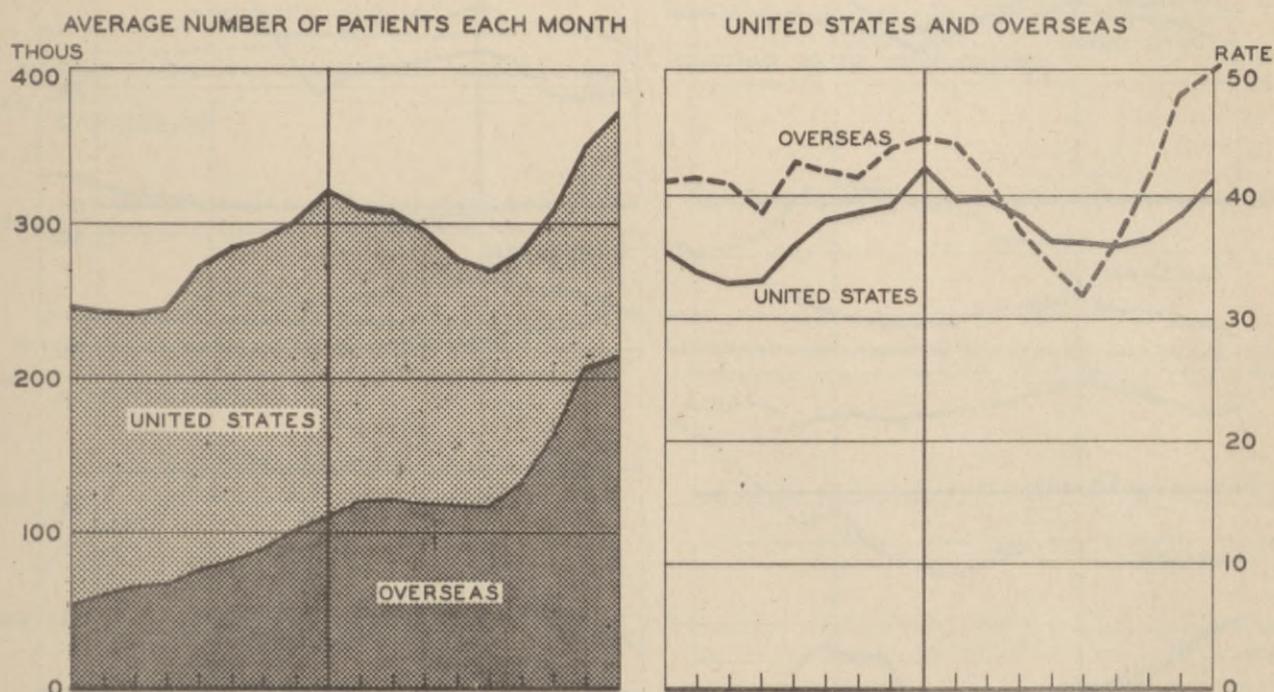
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NONEFFECTIVE RATES, U. S. AND OVERSEAS

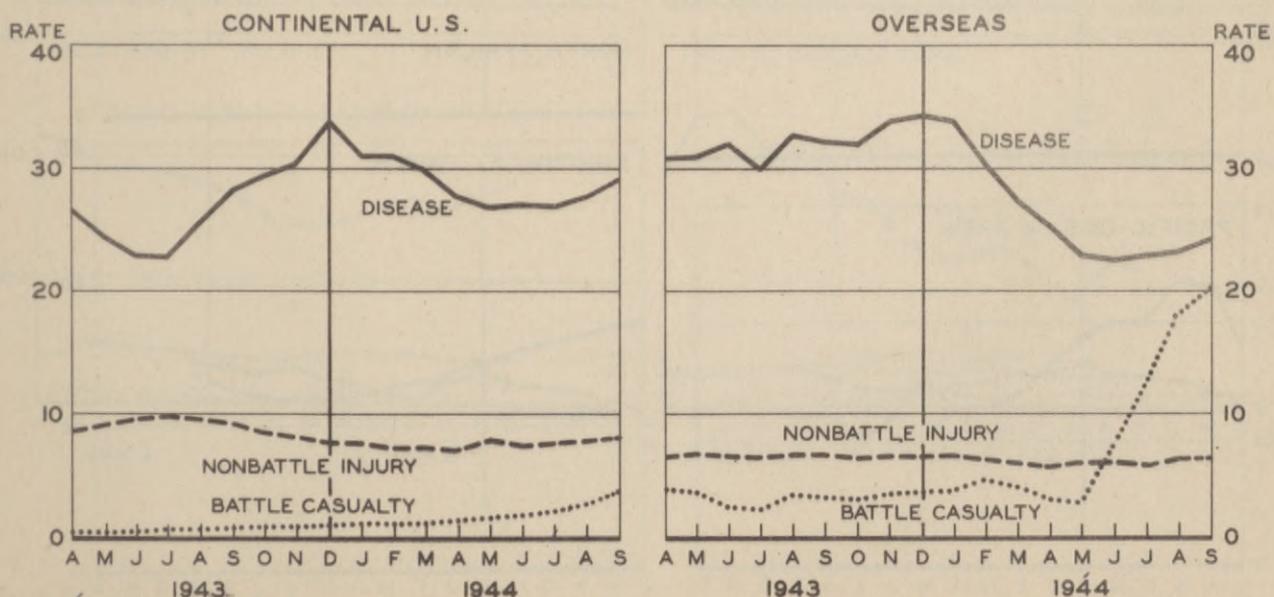
During September the average noneffective rate continued to increase both in the U. S. and overseas. The provisional overseas rate moved upward to 51 per thousand men per day from the rate of 48 in August, an increase of 6 percent. Noneffectiveness from battle casualties overseas rose less sharply than before, indicating somewhat lower casualty rates. In the U. S. noneffectiveness from battle casualty also continued to increase, reflecting the acceleration of evacuation from overseas. If the influence of evacuees is removed from the U. S. rate, the noneffective rate drops to about 31 noneffectives per thousand strength in comparison with the uncorrected rate of 42. Allowance for men hospitalized as a result of screening prior to overseas movement would probably reduce this rate to about 30 or less per thousand. Were these noneffectives charged against the overseas strength the overseas rate would rise by a corresponding amount.

The first panel below gives the absolute numbers of noneffectives throughout each month. The other panels give noneffective rates by major cause of admission.

AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH
ALL CAUSES



BY MAJOR CAUSE



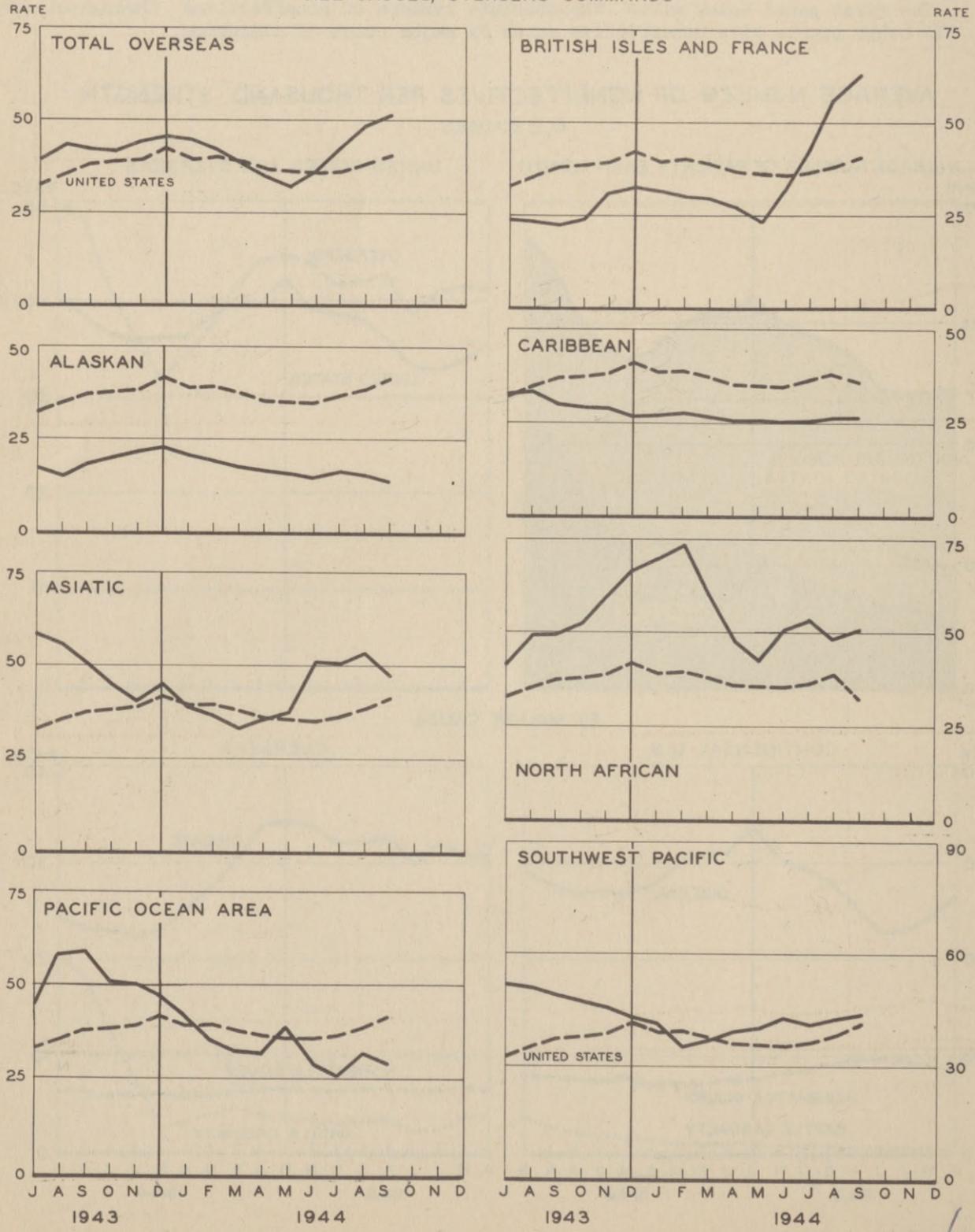
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DISEASE AND INJURY

NONEFFECTIVE RATES, OVERSEAS THEATERS

Shown below are the theater elements of the total overseas noneffective rates seen on the previous page. There was a general increase except in three theaters where the rate declined slightly, according to provisional estimates. The figures for the European Theater indicate a continued increase in noneffectiveness mainly attributable to the operations of troops on the continent. Data for this theater are especially provisional. Because of the great concentrations of troops in this theater the increase, although small, is large enough to exercise considerable influence upon the trend for all overseas theaters. The panels for the individual theaters permit comparison with the analogous rate for the U.S. Dis-

AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH
ALL CAUSES, OVERSEAS COMMANDS



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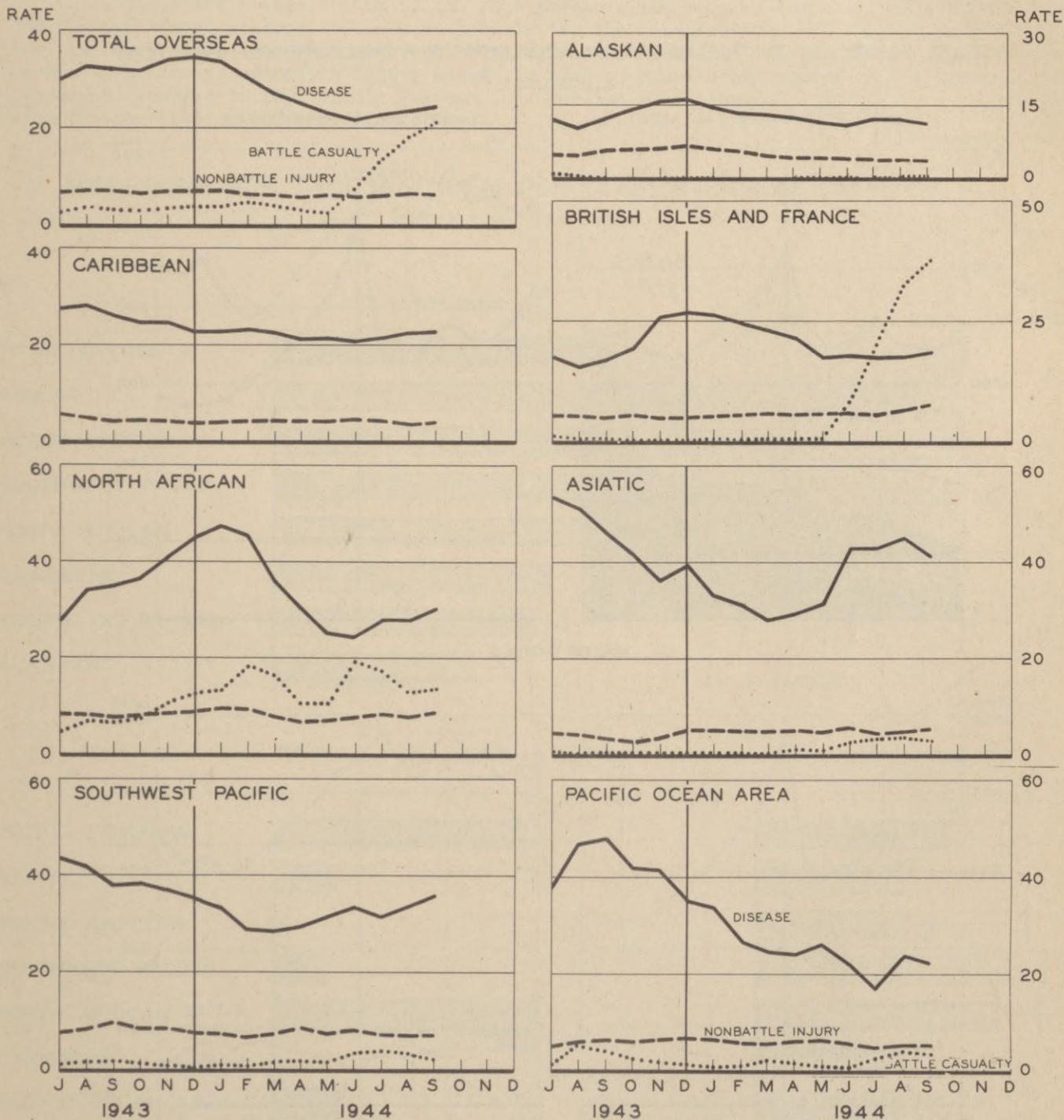
DISEASE AND INJURY

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NONEFFECTIVE RATES, OVERSEAS THEATERS (Continued)

ease, nonbattle injury, and battle casualty components of the theater noneffective rates are shown below. Noneffectiveness from disease is generally below the level for last year despite some increase during September. Nonbattle injury remains fairly constant, but the battle casualty component is moving rapidly in the European and North African theaters. The battle casualty rate was about 80 percent of that for disease during September and accounted for about 40 percent of all patients remaining in hospital and quarters during the month for all theaters.

AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH OVERSEAS COMMANDS



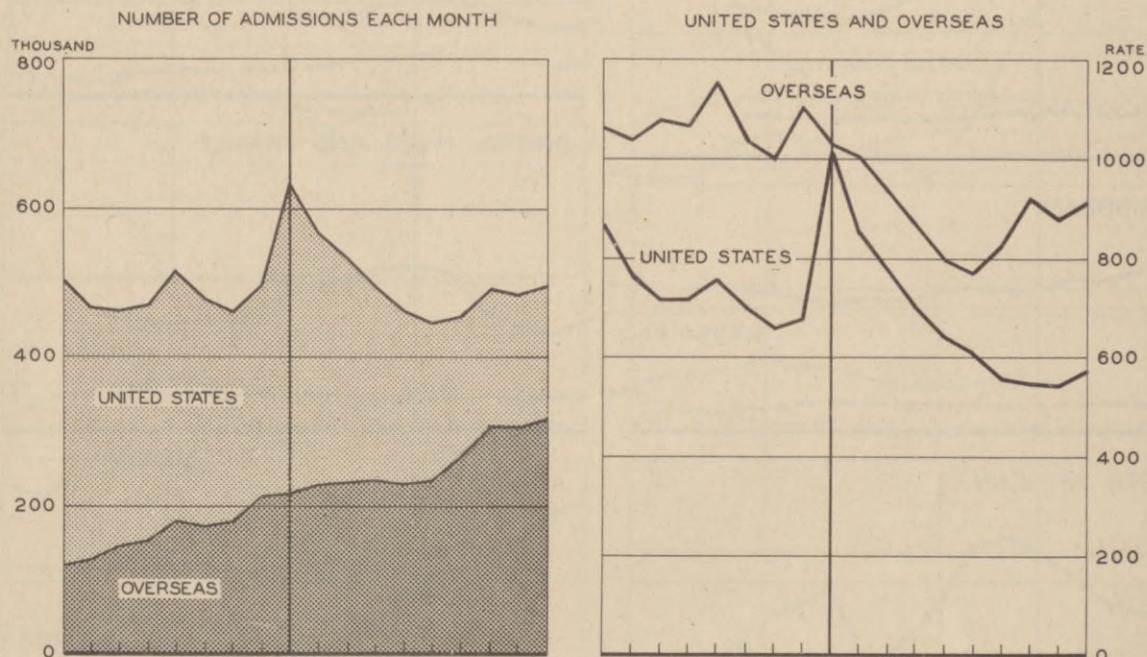
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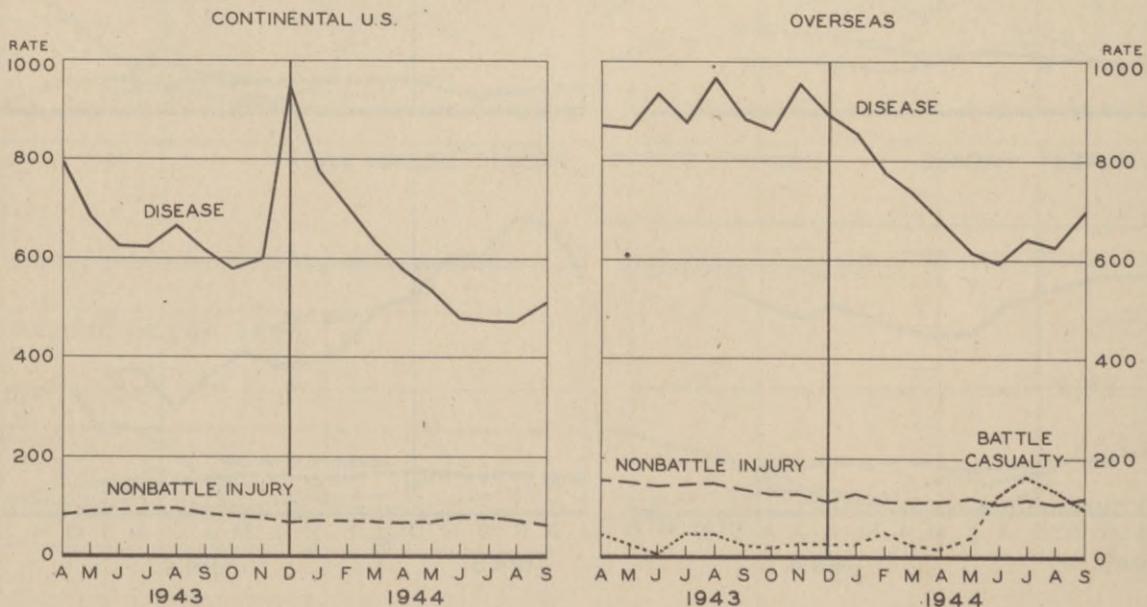
DISEASE, INJURY, AND BATTLE CASUALTY

During September the admission rate for all causes in the U. S. rose for the first time in nine months. However, the September rate is considerably lower than that for any month in 1943, or during the first five months of 1944. There was an increase of about 20 percent in admissions for respiratory diseases, which was reflected in the higher rate for all disease. The total overseas rate, extremely provisional in the absence of reports from both the North African and European theaters, shows a small increase. The disease rate for all overseas theaters rose slightly during September but there was a considerable decline in battle casualty admissions. Casualty reports received by the AGO reflect the lessened activity during September in both France and Italy. The nonbattle injury rate rose slightly overseas, and declined somewhat in the U. S., but continues to be a comparatively stable component of the total rates.

DISEASE, INJURY, AND BATTLE CASUALTY, ADMISSIONS PER THOUSAND MEN PER YEAR ALL CAUSES



MAJOR CAUSES



DISEASE AND INJURY

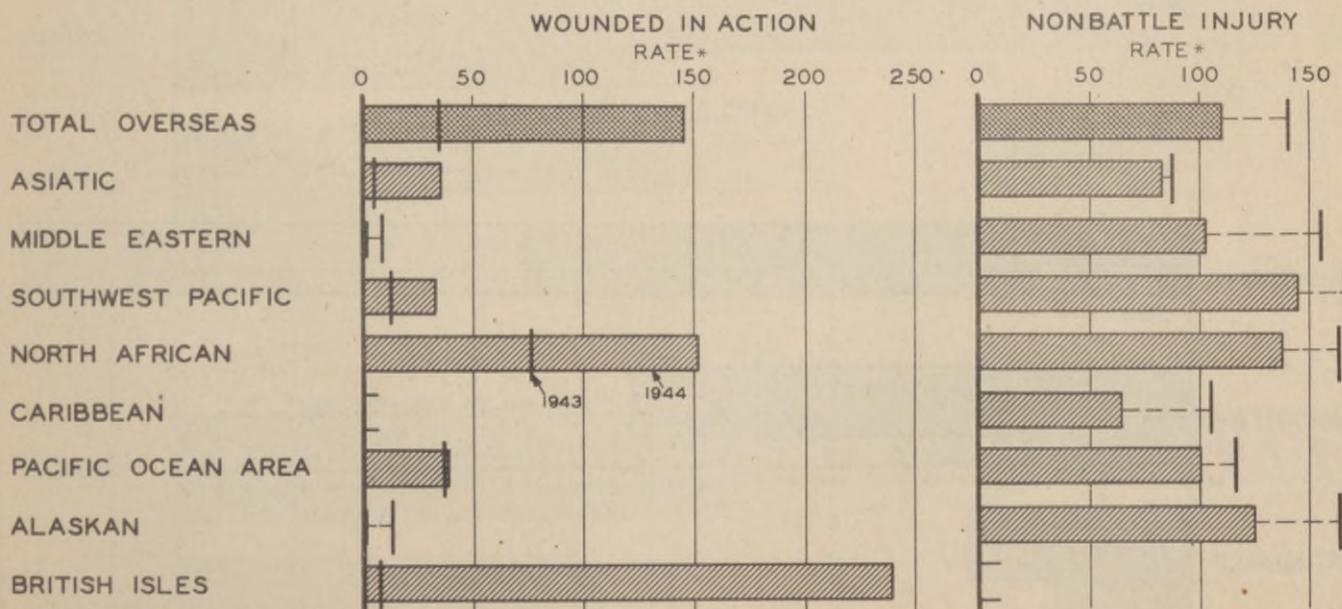
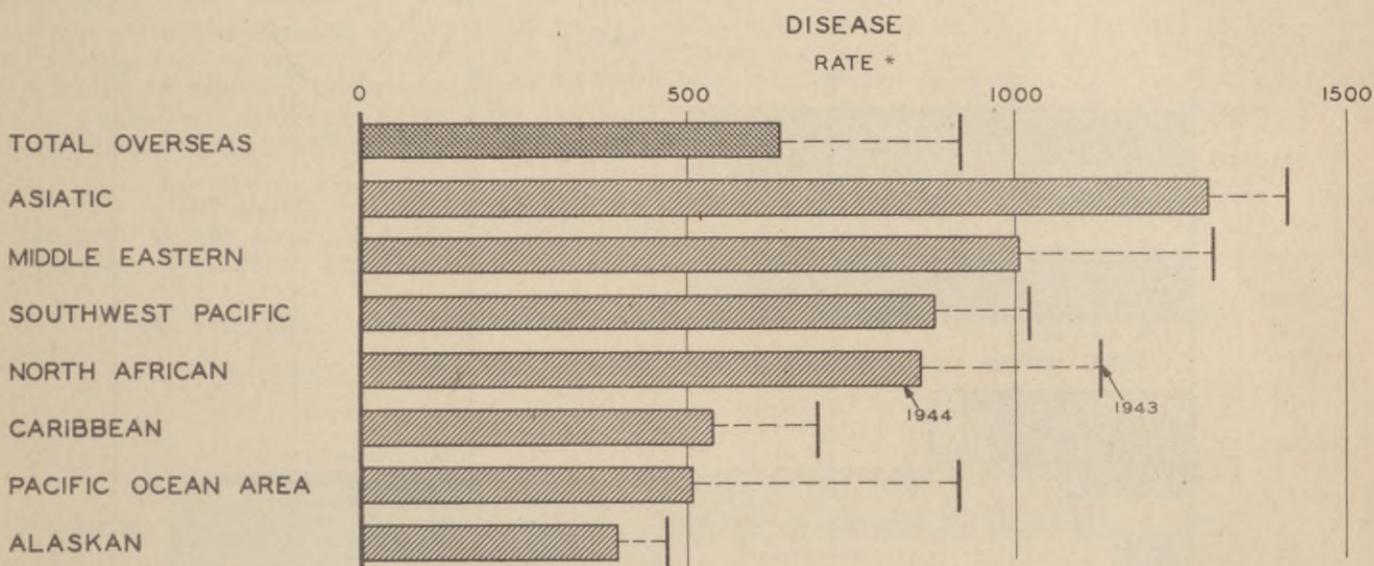
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RECENT ADMISSION RATES FOR DISEASE, INJURY, AND WOUNDED IN ACTION

With the possible exception of the European Theater, in every overseas theater the provisional nonbattle admission rates for June, July, and August 1944 are well below the corresponding rates for 1943. The total overseas rate declined perhaps as much as 30 percent during this interval, partly because of the greater concentration of overseas troops in the temperate climate of the European Theater and also because of the lower rates in each theater. For nonbattle injury the total overseas rate declined about 20 percent, but for wounded in action the rate rose about 300 percent. Nonbattle admission rates are not shown separately for the European Theater because reliable data are not available for June, July, and August. In preparing the consolidation for all overseas theaters it was assumed that the rates for the European Theater were the same as those for the corresponding months of 1943.

The chart at the bottom of the page presents the rates for individual theaters during the two summer seasons. The most notable decline occurred in the disease rate for the Pacific Ocean Area, chiefly because of the conquest of malaria in the South Pacific. The general decline in nonbattle injury rates is also of great significance. The greatest improvement occurred in the Middle Eastern and Persian Gulf commands, where the rate dropped from 155 for 1943 to the provisional level of 103 for 1944.

ADMISSIONS PER THOUSAND MEN PER YEAR, OVERSEAS THEATER
JUNE - AUGUST - 1943 - 1944



* Different Scales Used.

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DISEASE AND INJURY

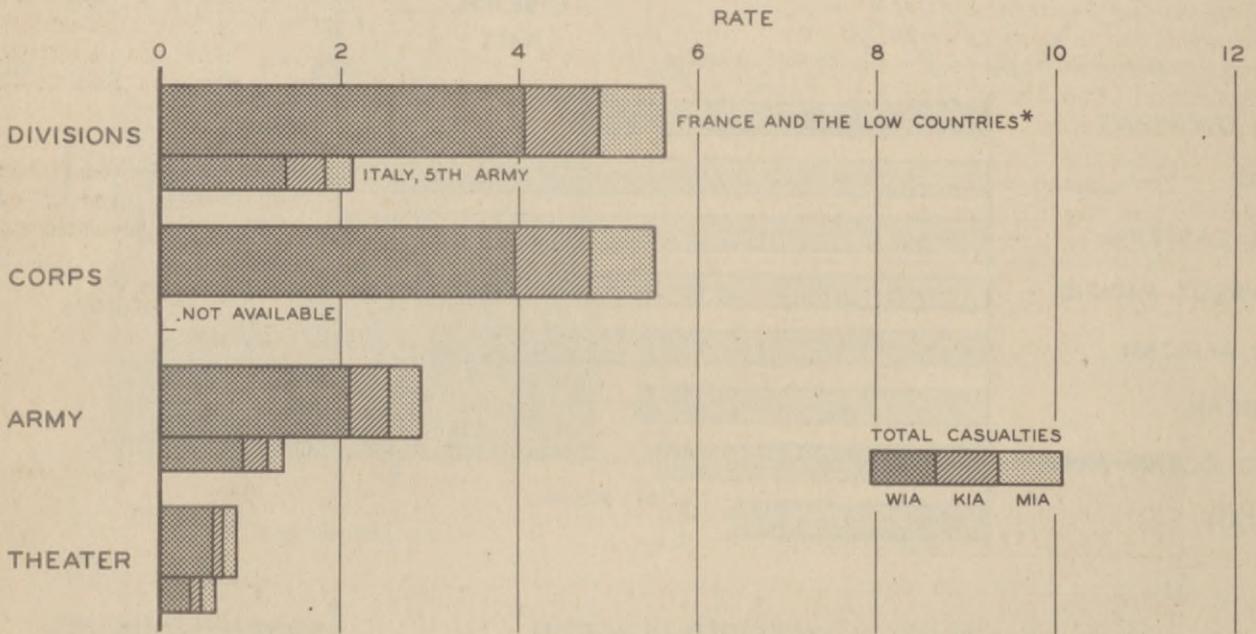
CASUALTIES IN ITALY, FRANCE, AND THE LOW COUNTRIES

During the four months following D-day in Normandy, U. S. ground forces in France and the Low Countries sustained casualties at a rate of 2.93 men killed, wounded, and missing per thousand army strength per day. This rate is only 71 percent of that which obtained during the first two months of the campaign, proportionately fewer casualties having been suffered during the second two months. The total rates for August and September are 2.68 and 1.78 per thousand men per day respectively, while those for June and July are 6.64 and 3.23. The table at the top of the next page gives the components of the total rates by months for the armies engaged in combat. The rates are provisional, being based upon preliminary radio reports to the A.G. giving the number of men killed, wounded, and missing.

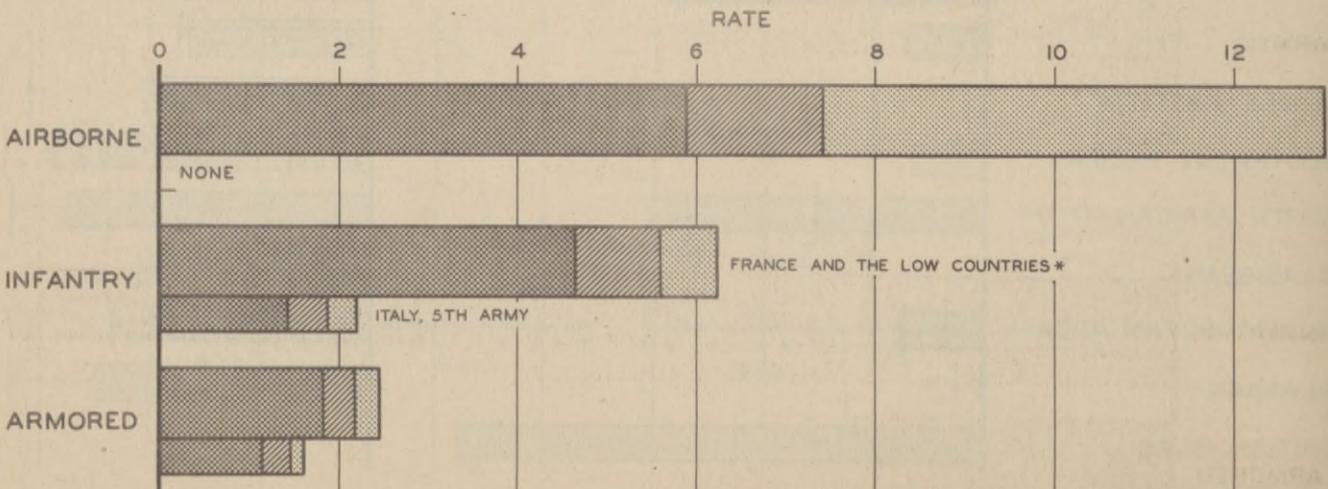
The top panel of the chart below compares the experience of the U. S. armies in France and the Low Countries with the average rates for the Fifth Army in Italy during the same period. All the rates reflect the experience of units while they were actually engaged in combat as well as while they were in reserve. However they pertain only to their experience after landing on the continent (including Italy). The experience of the 7th Army in southern France from 15 August through 30 September is not shown separately because of conflicting casualty reports. Since its reported casualties (by radio to the A.G.) have, never-

BATTLE CASUALTIES, ADMISSIONS PER THOUSAND MEN PER DAY

ITALY, 1 JUNE—30 SEPTEMBER; FRANCE AND THE LOW COUNTRIES, 6 JUNE—30 SEPTEMBER



TYPE OF DIVISION



* Excluding the 7th Army.

DISEASE AND INJURY

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CASUALTIES IN ITALY, FRANCE, AND THE LOW COUNTRIES (Continued)

CASUALTIES PER THOUSAND MEN PER DAY, ARMIES ON THE CONTINENT, ETC*

Month	Wounded	Killed	Missing	Total
June	4.10	0.81	1.73	6.64
July	2.49	0.56	0.18	3.23
August	1.95	0.42	0.31	2.68
September	<u>1.31</u>	<u>0.24</u>	<u>0.23</u>	<u>1.78</u>
June-September	2.11	0.44	0.38	2.93

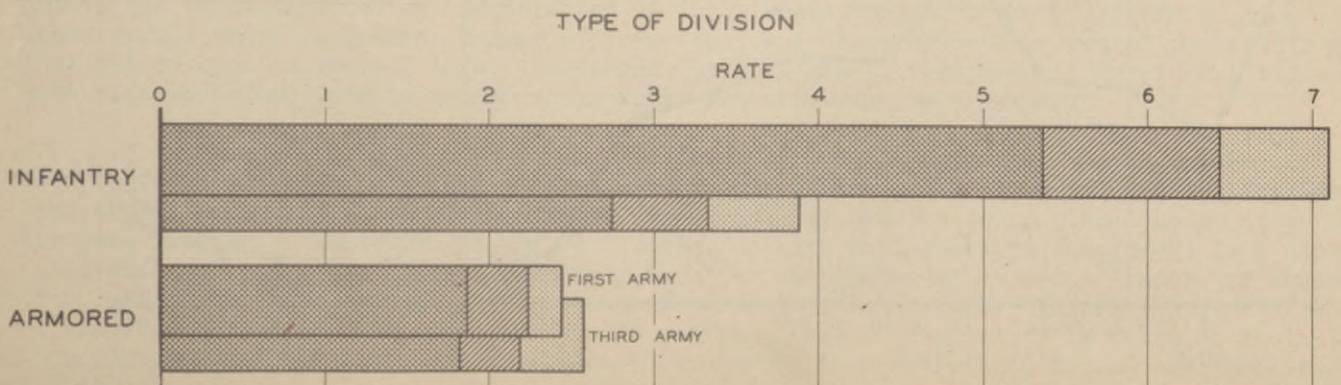
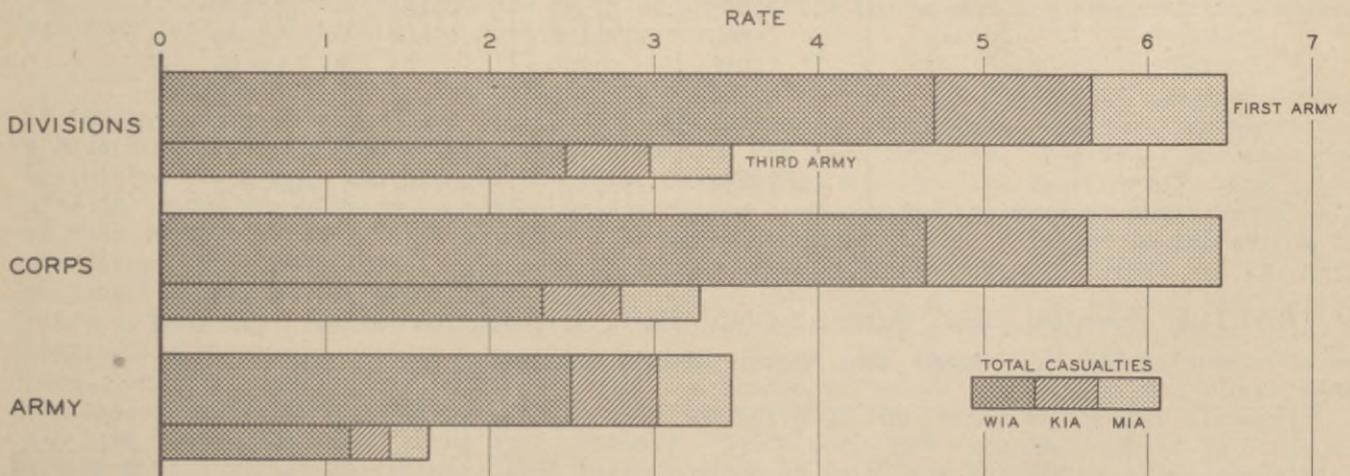
* Excluding the 7th Army.

theless, been included in the rate shown for the entire North African Theater, this figure is probably understated by an unknown amount. The variations among the rates by echelon and by type of division for the forces in northern Europe and for the Fifth Army in Italy parallel changes in the tactical situation during the past four months and also reveal the different composition of the armies involved. Since the beginning of June, combat activity has slackened greatly in Italy. Except for the operations culminating in the capture of Leghorn, the military activity has consisted mainly of advances against slight resistance on the part of German troops retreating toward the Gothic line. In France, however, subsequent to the fighting on the beachhead there was fairly continuous opposition which increased as the First Army neared the German frontier and the Third Army attempted to invest Metz. The higher proportion of service troops attached to the corps and armies in France and the Low Countries in comparison with the Fifth Army in Italy, explains the greater relative variation in the incidence among echelons of the armies in France.

The charts below compare the experience of the American First and Third armies with respect to the casualty rates of their divisions and corps, also giving rates by type of division. The Third Army began fighting as a unit about the time of the armored breakthrough

BATTLE CASUALTIES, ADMISSIONS PER THOUSAND MEN PER DAY

FIRST ARMY, 6 JUNE-30 SEPTEMBER; THIRD ARMY 29 JULY -30 SEPTEMBER



DISEASE AND INJURY

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CASUALTIES IN ITALY, FRANCE, AND THE LOW COUNTRIES (Continued)

at Avranches to the Brittany Peninsula on 1 August. Subsequently it moved eastward rapidly and did not meet strong resistance until the beginning of September when it approached the German fortress at Metz. The First Army, which contained all units on the continent in June and July, prior to the operation of the Third Army as a unit, is credited with all the strength and casualties in Normandy prior to 3 August. Its initial rates are therefore higher, but, except for a week of strong resistance prior to the capture of Paris on 25 August, its recent casualty rates have been similar to those of the Third Army. Heavier opposition was encountered as the German frontier was approached in the middle of September.

The experience of the Ninth U. S. Army is not shown because of its small size and also because it was constituted only recently, but its units have suffered relatively large numbers of casualties. From 8 September through 30 September the Ninth Army sustained casualties (killed, wounded and missing) at a rate of 3.41 per thousand men per day in comparison with 3.47 and 1.63 for the longer and more varied experience of the First and Third Armies.

The casualty rates of the divisions composing the American armies have been quite variable. Based upon their operations during the entire period of time on the continent, rates for infantry divisions vary between 2.32 wounded per thousand strength per day for the 1st Division to 6.80 for the 29th Division. Rates for armored divisions are all lower than the 1st Infantry rate, the range being from 1.33 for the 4th to 2.32 for the 7th Armored Division.

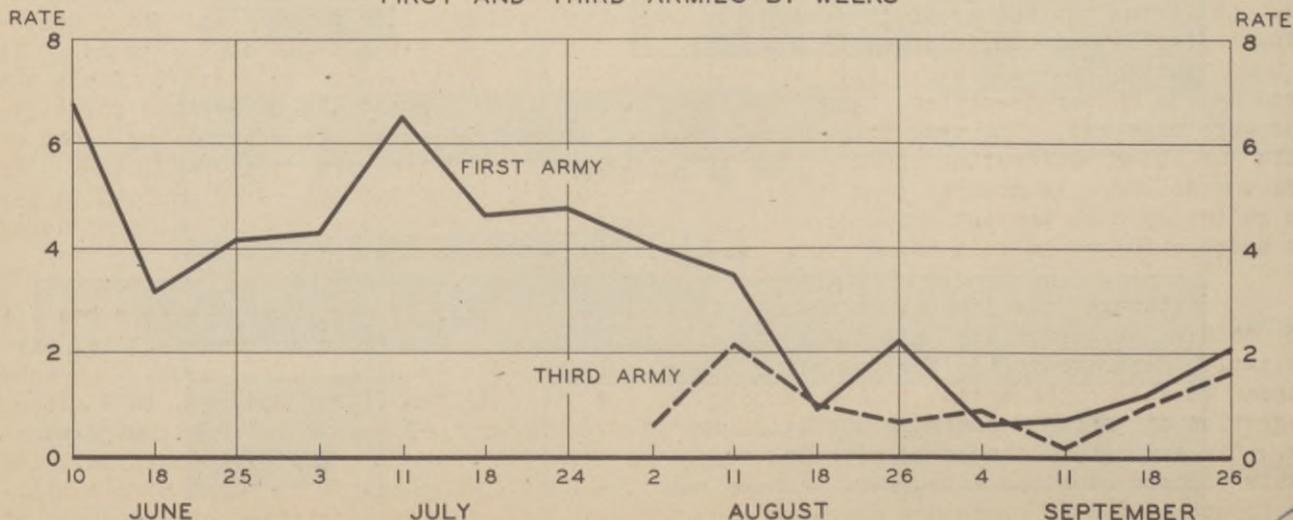
From 6 June through 10 September, 222,951 battle casualties (killed, wounded, and missing) were sustained by all allied armies on the continent (ETO). A British intelligence document reports the following provisional numbers of casualties among the various forces.

MEN KILLED, WOUNDED, AND MISSING IN FRANCE AND THE LOW COUNTRIES

Force	From 6 June to	Number of Casualties			
		Wounded	Killed	Missing	Total
American*	10 Sep	102,350	22,568	10,967	135,885
British	8 Sep	46,022	12,868	7,116	66,006
Canadian	8 Sep	12,503	3,355	2,126	17,984
French	10 Sep	867	178	464	1,509
Polish	8 Sep	1,042	299	93	1,434
Belgian	8 Sep	66	20	1	87
Dutch	8 Sep	42	4	0	46
Total		162,892	39,292	20,767	222,951

* Ground only.

BATTLE CASUALTIES,* ADMISSIONS PER THOUSAND MEN PER DAY
FIRST AND THIRD ARMIES BY WEEKS



* Wounded only

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DISEASE AND INJURY

SECONDARY CLOSURE OF WOUNDS

A highly significant advance has been made in military surgery through the extensive application of a relatively new concept of wound management. Healing is accelerated, restoration of function is hastened, and ultimate disability and deformity are minimized by the technique of secondary closure now being performed in base hospitals following the initial or primary surgery of forward installations.

Judged by the highest possible standards, the military environment precludes ideal surgical practice and imposes certain modifications upon the treatment of the wounded. In civilian life the injured patient is hospitalized and operated upon within a few hours after injury. Since the average patient can remain in the hospital under close observation until his recovery, it is possible to perform a single operation consisting of two phases, first the debridement or removal of all devitalized tissue, and then the surgical closure of the wound. In military surgery the ideal conditions of civilian practice rarely exist. The time lag between wounding and surgical treatment usually far exceeds the period within which "safe" initial closure of the wound is possible. Even were it possible to institute surgery within a few hours after wounding, the necessity for rapid evacuation in the interest of the mobility of the forward units would usually make it dangerous to institute primary closure immediately following initial wound surgery. Although a certain proportion of wounds treated in this manner would heal satisfactorily, it is not possible to know with certainty in which infection will develop. Primary closure enhances the development of life-endangering infection and interruption in the continuity of professional supervision imposed by evacuation precludes its early detection. For these reasons it has become a well-established principle of military surgery that wounds shall be left open after the initial debridement. Although the adoption of this rule has been justified as a safeguard against infection, it has involved a heavy penalty in the form of protracted convalescence and the formation of excessive scar tissue. Efforts to obviate these disadvantages have led to the development of reparative surgery.

With the widespread use of secondary closure in wound surgery, the treatment of serious wounds has approached the ideal technique possible under non-military conditions, the major difference being that the two phases of a single operation are separated into two distinct operations performed at different echelons of medical care. The initial phase, done in the forward area, is directed toward the prevention of infection and the preparation of the patient for transportation. Proper debridement of the wound minimizes the chances of infection and prepares the way for prompt and successful secondary suture following evacuation. Penicillin and the sulfonamides are of value in reducing the extent and gravity of infection, but they cannot substitute for good primary surgery.

The next step in the care of the wound under this new concept of wound management is the secondary or reparative phase, usually done after the patient has been transported to a base hospital. If the initial wound operation has been complete, the wound may be closed by suture, usually at the time of the first dressing on or after the fourth day. The proper time for secondary closure by suture is determined by the gross appearance of the wound rather than by bacteriologic studies, as was formerly necessary. This shift in emphasis from the microscopic to the clinical appraisal of the wound is a real advance in itself and is partly responsible for the practicability of secondary wound-closure on a large scale. If there is evidence of slight infection, appropriate measures are taken to "clean up" the wound prior to instituting secondary closure, usually a few days later. If the established infection is severe, or if the patient is toxic or anemic, a course of penicillin therapy and blood transfusion is instituted and followed by surgical revision of the wound and staged closure. It has been estimated that among approximately 25,000 soft-part wounds received in Italy and closed in the manner described, good healing occurred in 95 percent and no serious complications were observed. The more complicated types of wounds, such as those involving bones or joints or those manifesting penetration of the viscera, require more elaborate care. In these wounds there is greater danger of infection, and the prophylactic use of penicillin has been relied upon to prevent infection during both stages of treatment. Surgical procedures have been performed in this manner which would not otherwise be possible.

Although the idea of secondary closure is not entirely new, never before has it been safe to encourage its use under military conditions. Its value and feasibility have been amply demonstrated in North Africa, and great reliance is being placed upon it in the European Theater. Essential to the realization of its full benefits, however, is a closer integration of forward and base hospitals from the standpoint of speed and ease of evacuation. Air evacuation should be of great assistance in this respect. The full potentialities of this concept of wound management can be realized only if cognizance is taken of its military import in future plans and operations, especially from the standpoint of the location of the various echelons of medical care with a view to providing earlier primary surgery and a shorter evacuation time between forward and base hospitals.

DISEASE AND INJURY

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FIFTH ARMY CASUALTY EXPERIENCE

The longest campaign for which casualty information is available is that which followed the amphibious landing at Salerno, Italy. Although U. S. forces have been in action longer in the Solomons and in New Guinea, the experience of the Fifth Army is unique in its carefully recorded detail over a long period. The rates for wounded in action (hospitalized) are shown weekly for the Fifth Army from 9 September 1943 to 7 October 1944. For comparison, similar information is presented for the Seventh Army during the operations in Sicily. At the top of the chart are indicated important landmarks of the campaign and intervals of noteworthy activity. Through the end of August 1944 the rates are based upon theater tabulations prepared by machine records units in the theater. The rates for September and October are based upon provisional casualty reports to The Adjutant General and upon estimated strengths.

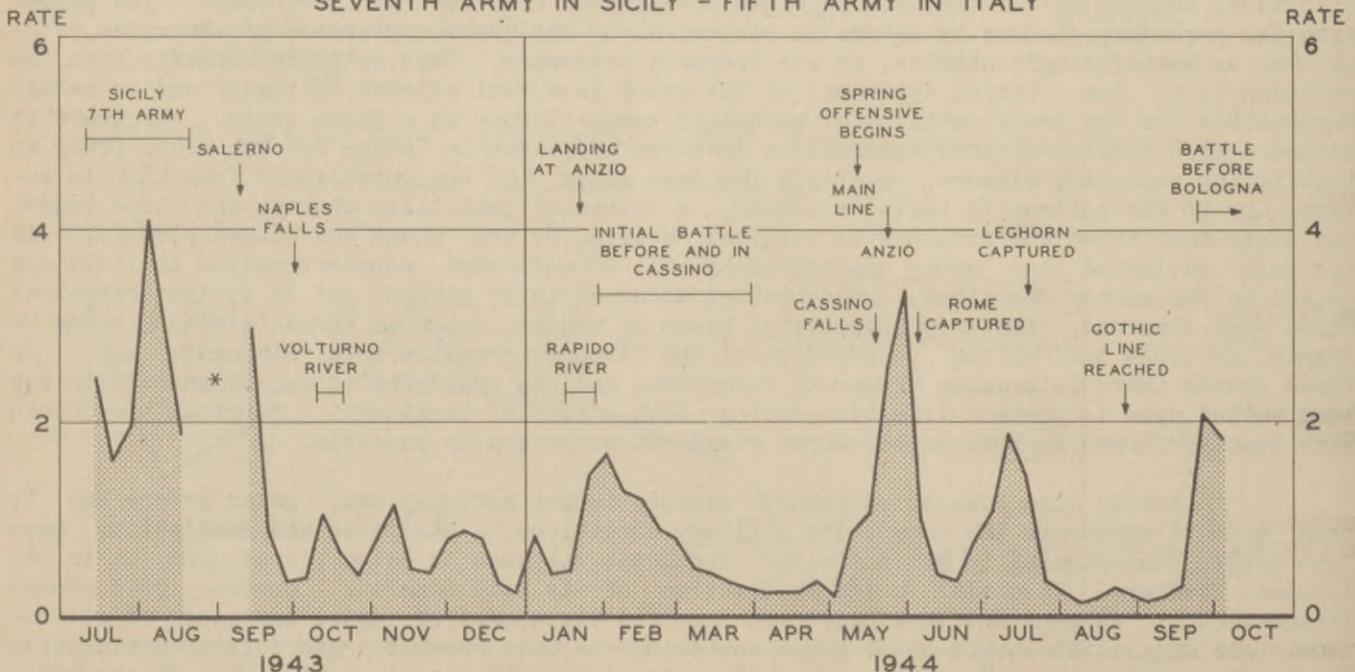
The campaign in Italy has been punctuated by peaks in the incidence of casualties. Following the fall of Naples tactical activity proceeded at an uneven pace marked by episodic German resistance and retreat. Most of the variations in the rates are attributable to the ebb and flow of combat activity but the amplitude of some of the fluctuations is directly related to the relative size of the actual combat force and of the service units under army control. The battles fought to cross the Volturno and Rapido rivers are generally referred to as "bloody", but the army rates during these operations were not as high as they were during the initial phase of the battle for Cassino or the drive on Leghorn. This is explained by the fact that the number of combat troops involved in these operations was fairly small.

Shortly after the capture of Rome, in preparation for the invasion of southern France, the Seventh Army, which had been disbanded after its conquest of Sicily, was reconstituted for the invasion of southern France. Three infantry divisions, the 3rd, 36th, and 45th, were detached from the Fifth Army during June and July and reassigned to the Seventh Army together with service units. Later the 91st and 92nd infantry divisions (new) were assigned to the Fifth Army.

The left-hand panel of the chart on the following page provides the killed and wounded components of the casualty rates for the particular phases of the Italian campaign. The actions are ranked according to the magnitude of the army rate at the time, and the average Fifth Army rate for the entire period, covered in detail by the chart below, is also included. The casualty rate was highest during the spring offensive which opened at Cassino and on the Garigliano River. The army rate was 2.39 for wounded and .54 per thousand men per day for killed. These rates are about as high as those which prevailed in France during July. They were high not only because a large proportion of the troops involved were combat troops, but also because the rates were high at the divisional and regimental levels.

BATTLE CASUALTY HOSPITAL ADMISSIONS PER THOUSAND MEN PER DAY

SEVENTH ARMY IN SICILY - FIFTH ARMY IN ITALY



* Not available.

DISEASE AND INJURY

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FIFTH ARMY CASUALTY EXPERIENCE (Continued)

The panel below and to the right compares the divisional casualty rates of the various allied forces in Italy between 12 May and 31 May 1944, as reported to The Surgeon General. The rates are expressed in terms of T/O strength. During this period the Fifth and Eighth armies attacked with nine British, seven American, four French, and two Polish divisions having a total authorized strength of about 362,000 men. From 11 May through 30 June 1944 the average divisional casualty rate (killed, wounded, and missing) for Fifth Army units was 7.7 per 1,000 T/O strength for combat time only and 3.8 for calendar time. In comparison, similar rates for the first six months in Italy, a period which included the crossings of the Volturno and Rapido rivers and the first battle for Cassino, were only 3.7 per 1,000 T/O strength for divisions while they were in combat and 2.7 per 1,000 per day for the entire period.

From the beginning of the allied campaign in Italy to 12 September 1944, the Fifth and Eighth Armies, including attached French, Polish, and Italian forces, are estimated to have sustained about 215,000 battle casualties of all kinds, or only 4 percent less than the number in France and the Low Countries tabled on page 8. The same source used there lists the casualties of the Italian campaign as follows:

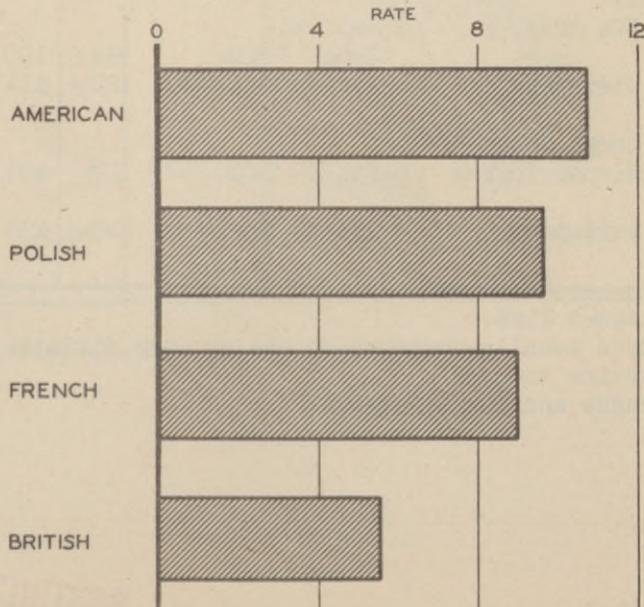
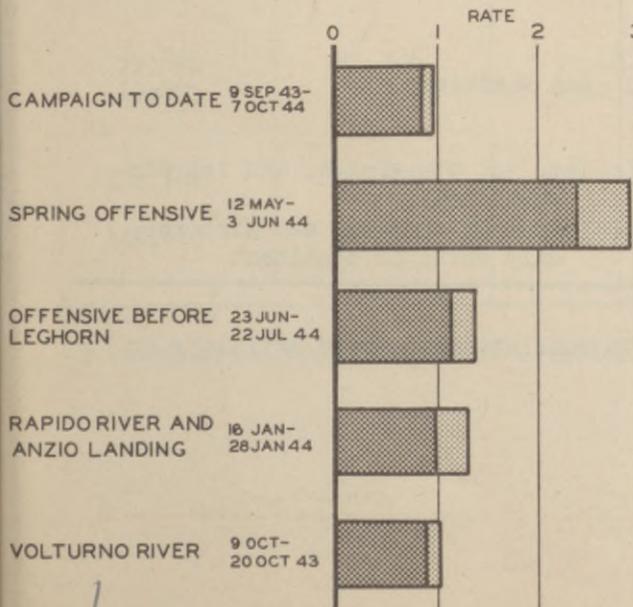
ALLIED CASUALTIES IN ITALY

Cumulative to Date Noted

Force	From 3 Sep 1943 to	Number of Men			
		Killed	Wounded	Missing	Total
British Forces	12 Sep '44	13,603	42,406	10,515	66,524
Indian Army	12 Sep '44	2,369	9,149	477	11,995
Canadian	12 Sep '44	2,811	9,279	465	12,555
New Zealand	12 Sep '44	1,100	4,067	252	5,419
South African	12 Sep '44	470	1,972	101	2,543
Total Imperial Forces		20,353	66,873	11,810	99,036
U. S. (Ground)	2 Sep '44	14,659	53,009	10,407	78,075
French	2 Sep '44	5,241	20,801	1,583	27,625
Polish	2 Sep '44	1,413	5,861	490	7,764
Italian	2 Sep '44	407	1,147	570	2,124
All Forces		42,073	147,691	24,860	214,624

FIFTH ARMY CASUALTIES PER THOUSAND MEN PER DAY, BY PHASE

ALLIED WOUNDED PER THOUSAND MEN PER DAY, BY FORCE 12 MAY TO 31 MAY 1944



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DISEASE AND INJURY

CAMPAIGN CASUALTY RATES

The table below presents the casualty experience of U. S. ground forces in some of the more important operations and campaigns which have been undertaken in the European and Pacific areas. The data are preliminary, although they represent the best information avail-

CAMPAIGN CASUALTIES

Campaign	Period	Days *	Mean Size of Force	Remarks
<u>PACIFIC AREAS **</u>				
Attu	11 May- 1 Jun '43	22	15,200	Army Operation
Gilbert Islands				
Army Only	21 Nov-23 Nov '43	3	6,600	Makin Island
Marine Only	20 Nov-23 Nov '43	4	19,600	Tarawa
Average	20 Nov-23 Nov '43	4	24,500	
Marshall Islands				
Army Only	31 Jan- 5 Feb '44	6	21,300	South Kwajalein
Marine Only	31 Jan- 2 Feb '44	3	18,000	North Kwajalein
Joint	31 Jan- 5 Feb '44	6	10,000	Eniwetok
Average		6	40,300	
Admiralty Islands	1 Mar-31 Mar '44	31	15,900	Army Operation
Biak	27 May-30 Jun '44	35	22,900	Army Operation
Saipan				
Army Only	15 Jun- 9 Jul '44	25	24,000	
Marine Only	15 Jun- 9 Jul '44	25	35,000	
Average		25	59,000	
Guam	21 Jul- 9 Aug '44	20	27,300	Marine Casualties Only, Army Not Available.
<u>EUROPEAN AREAS</u>				
Sicily				
7th Army	10 Jul-20 Aug '43	42	164,000	
Divisions	--	--	--	Not Available
Italy				
5th Army	9 Sep '43- 7 Oct '44	395	190,000	
Divisions	1 Jun-30 Sep '44	122	114,000	All Divisions
Northern France***				
Ground Forces	6 Jun-30 Sept '44	117	497,000	1st, 3d, 9th Armies, and 1st Airborne Army.
Divisions	6 Jun-30 Sep '44	117	235,000	Infantry, Armored, and Airborne, only while on continent.

* Elapsed Time.

** Force usually composed of one or more divisions with some attached corps artillery or service troops.

*** France and Low Countries.

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CAMPAIGN CASUALTY RATES (Continued)

able in the Office of The Surgeon General. It has not been possible to derive suitable rates for any of the operations in New Guinea, the Solomons, New Georgia, or Tunisia. The collection of data has been hampered by the lack of a coordinated plan for the collection of uni-

CAMPAIGN CASUALTIES

Number of Casualties Reported			Rates per Thousand Men per Day *			Campaign
W.I.A.	K.I.A.	Total#	W.I.A.	K.I.A.	Total#	
<u>PACIFIC AREAS **</u>						
1,148	549	1,697	3.43	1.64	5.07	Attu
187	66	253	9.44	3.33	12.77	Gilbert Islands
2,245	864	3,109	28.63	11.02	39.65	Army Only
2,432	930	3,362	24.76	9.47	34.24	Marine Only
Average						
Marshall Islands						
1,037	177	1,214	8.11	1.39	9.50	Army Only
116	77	193	2.15	1.43	3.58	Marine Only
786	299	1,085	13.10	4.98	18.08	Joint
1,939	553	2,492	8.02	2.29	10.31	Average
950	208	1,158	1.93	.42	2.35	Admiralty Islands
1,870	237	2,107	2.33	.30	2.63	Biak
Saipan						
2,676	941	3,617	4.46	1.57	6.03	Army Only
8,198	1,945	10,143	9.37	2.22	11.59	Marine Only
10,874	2,886	13,760	7.37	1.96	9.33	Average
2,626	933	3,559	4.81	1.71	6.52	Guam
<u>EUROPEAN AREAS</u>						
Sicily						
17,259	1,649	18,908	2.51	.24	2.75	7th Army
--	--	--	--	--	--	Divisions
Italy						
5th						
59,895	14,286	74,181	.80	.19	.99	Army
19,303	5,931	25,234	1.39	.43	1.82	Divisions
Northern France ***						
122,742	25,606	148,348	2.11	.44	2.55	Ground Forces
111,470	22,777	134,247	4.05	.83	4.88	Divisions

Missing excluded because of especially incomplete and inaccurate reporting.

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CAMPAIGN CASUALTY RATES (Continued)

form casualty data on the basis of campaigns and operations. Medical reports received in Washington are inadequate for this purpose, and the occasional reports received from the field tend to be fragmentary and inconsistent, and often fail to provide both strengths and casualties on a basis suitable for matching. It is believed that great value would attach to a systematic collection of casualty data by type of operation, and the present study is made merely to suggest the possible value which such information might have.

In order to show the overall casualty experience in amphibious landings on Pacific Islands it was necessary to incorporate data of the Marine Corps with what Army experience was available for joint operations. However, wherever it is available, the Army experience has also been shown. The rates given for the Gilbert and Marshall Islands and for Saipan in the Marianas Islands include casualties sustained by the Marine troops participating, but exclude the experience of supporting naval units. The rate for Guam is based entirely upon Marine experience, it having been impossible to obtain the information for the 77th Army Infantry Division which also fought on the island.

The force involved in each of the actions in the Pacific has been relatively small, usually a small corps or a reinforced division. The rates are relatively high because service troops, if present at all, have constituted a very small proportion of all the troops and also because the action has been so short that a very high proportion of the days have been combat days. In the European area, on the other hand, rates for the entire forces involved are much lower than the Pacific rates for the reason that they are for entire armies, or army groups. The casualties sustained by the combat elements of such large forces tend to be offset by the presence of large numbers of personnel in non-combat organizations. In the interests of greater comparability, the divisional rates have been included for the campaigns in Italy, and northern France and the Low Countries. Divisional rates are not available for the Sicilian campaign.

In the Pacific complete operations have often been accomplished in a matter of days or a few weeks. As a result, units have been employed continuously during operations, and casualties have tended to occur throughout the period. Inasmuch as the 5th Army has seen intervals of little activity and contains a large number of service troops, and since some of its units have at times been in reserve, its rate for 9 September 1943 through 7 October 1944 is relatively low in comparison with the rates for the Pacific operations. However, for particular phases of the campaign, divisional rates of the 5th Army have been as high as or higher than most rates for the smaller Pacific operations. Casualties were sustained by all of the divisions of the 5th Army at the rate of 10.8 per thousand men per day (authorized strength) during the 20 day period from 12 to 31 May, the spring offensive which culminated in the capture of Rome.

There are several types of estimation for which casualty data similar to those shown here may be used and, by the same token, for which they should be gathered:

1. Casualties by type of operation, and by echelon;
2. Replacement needs;
3. Transportation requirements, especially for evacuation and replacement; and
4. Need for hospitalization and medical support generally.

If a military operation is to consist of an amphibious landing on a small island, rates such as those which obtained in the Central Pacific operations should be of the greatest value, supplemented by information concerning the disposition of enemy forces and reinforcements. If the projected operation entails the landing of a large, self-sustaining force of combat troops well supported by service troops, in anticipation of a protracted campaign over varying terrain, then the longer experience of the 5th Army in Italy might provide a better guide. For purposes of medical planning and replacement, a casualty rate should be selected which most directly applies to the size of the force which is to be dispatched and the probable duration of the action. Finally, the estimate should be governed by the size of the attacking force in relation to that defending the objectives. The casualties during a short action by a sizeable attacking force containing a large number of service troops will be overestimated if rates like those for the Gilbert Islands operations are used, and perhaps underestimated if the 5th Army rate were to be employed. Only by collecting casualty data with an eye to the significant variables can a body of experience be provided adequate to serve the manifold needs for estimation.

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CASUALTY RATES BY MILITARY OCCUPATIONAL SPECIFICATION, FIFTH ARMY

The Fifth Army has recently concluded a valuable study of its battle and nonbattle casualties from the standpoint of the military occupational specification to which members of combat divisions were assigned. Apart from providing a basis for classifying replacement needs by MOS, the data illustrate the strong relation which exists between the incidence of battle and nonbattle casualties under certain combat conditions. The observations are based upon the experience of the 3rd, 34th, 36th, and 45th infantry divisions while they were in combat between 9 September 1943 and 4 April 1944, and are thus heavily weighted by winter experience. Morning reports, supplemented by the medical reports of a sample of evacuation and convalescent hospitals, provided the basic data. Admissions may be understood as admissions to hospital, broadly construed as all patients actually receiving bed-care, but it is possible that some quarters cases may have been included.

From the standpoint of replacements, it is not only the incidence of casualties but also the proportions returning to duty which are important. Information on returns to duty is not available by MOS, but it was tabulated for infantry, artillery, and other branches. For the period in question, the experience of the four combat divisions yields the following percentages of casualties returned to their units.

PERCENTAGE OF CASUALTIES RETURNED TO THEIR UNITS, BY ARM OR SERVICE

Cause of Admission	Arm or Service			
	Infantry	Artillery	Other	Total
Battle Casualty	26	37	32	27
Nonbattle Casualty	51	83	77	57
All Casualties	40	73	70	45

These figures may be applied to the gross casualty figures by MOS if divisional replacement needs are to be estimated on the basis of the Italian campaign for the period studied. The

BATTLE AND NONBATTLE CASUALTIES BY MOS, FOUR INFANTRY DIVISIONS, FIFTH ARMY
October 1943 through March 1944

Military Occupational Specification		Percent of Division Casualties			Casualties per 1,000 T/O Strength per Division Combat Day		
Number	Title	Battle	Nonbattle	Total	Battle	Nonbattle	Total
745	Rifleman	38.1	25.5	30.4	12.2	10.7	22.9
603	Gunner	8.0	5.5	6.4	6.2	5.5	11.7
653	Squad Leader	8.1	7.5	7.8	5.2	5.9	11.1
761	Scout	1.1	1.0	1.0	4.9	5.5	10.4
657	Litter Bearer	1.2	1.7	1.5	3.4	5.8	9.2
746	Automatic Rifleman	3.9	2.9	3.4	4.8	4.3	9.1
652	Section Leader	1.4	1.7	1.6	3.7	5.4	9.1
651	Platoon Sergeant	1.8	1.8	1.9	3.9	4.7	8.6
504	Ammunition Handler	8.3	9.0	8.7	3.6	4.8	8.4
238	Lineman Tel. & Tel.	1.4	2.0	1.8	2.7	4.7	7.4
675	Messenger	2.6	2.5	2.6	2.8	3.3	6.1
610	Anti-tank Gunner	1.0	1.0	1.0	2.4	3.3	5.8
060	Cook	0.7	1.9	1.4	1.2	4.5	5.7
531	Cannoneer	1.2	2.7	2.1	1.4	4.2	5.6
245, 345	Truck Driver	2.6	7.0	5.3	1.0	3.5	4.5
014	Auto Mechanic	0.4	1.0	0.7	1.0	3.3	4.4
539	Section Chief	0.2	0.5	0.4	1.0	3.3	4.3
225	Surgical Technician	0.5	0.7	0.6	1.6	2.5	4.0
177	Radio Operator	0.5	0.9	0.7	1.1	2.4	3.6
521	Basic	4.0	4.1	4.0	1.4	1.9	3.3
821	Supply NCO	0.2	0.5	0.3	0.8	2.6	3.3
695	Orderly	0.2	0.4	0.3	0.9	2.1	3.0
405	Clerk Typist	0.2	0.6	0.4	0.5	2.0	2.5
	Other Enlisted Men	7.0	13.1	10.9	1.8	3.7	5.5
	TOTAL ENLISTED MEN	94.6	95.5	95.2	3.7	4.7	8.4
	OFFICERS	5.4	4.5	4.8	4.0	4.2	8.2
	TOTAL DIVISION	100.0	100.0	100.0	3.7	4.7	8.4

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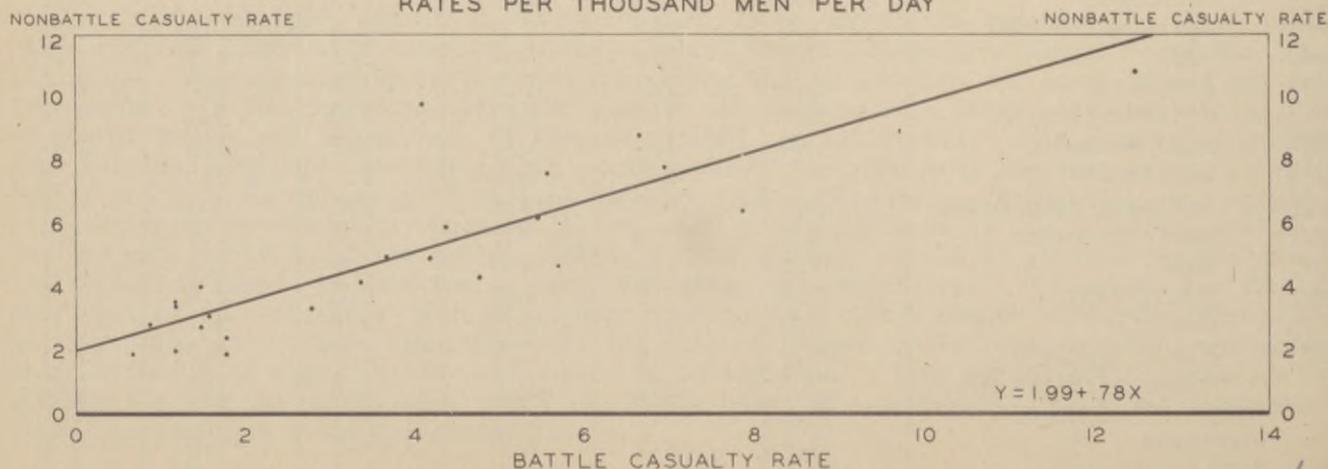
CASUALTY RATES BY MILITARY OCCUPATIONAL SPECIFICATION, FIFTH ARMY (Continued)

accompanying table gives the casualty rates for each MOS, based on its average divisional T/O strength, regardless of arm or service. The table lists only those specifications for which there were 100 or more men in the T/O of the infantry division during this period. The first section of the table states what percent of all the casualties of any type involved men with particular specification numbers. Thus, 38.1 percent of all the divisional battle casualties (killed, wounded, and missing) were on the part of riflemen. The second panel of the table gives the average daily casualty rates for each MOS, by type of casualty. For MOS number 603, for example, there were 6.2 battle, and 5.5 nonbattle casualties per 1,000 gunners per divisional combat day. The military occupations are ranked according to their total casualty rates. For the Fifth Army during the entire period December through March the average rates were 1.2 for battle casualties and 3.3 for nonbattle casualties. For the theater as a whole from 1 October 1943 to 1 April 1944 the comparable rates were .4 and 3.0 admissions per 1,000 men per day. The occupation of rifleman is seen to be the most dangerous by a very wide margin. Both the battle and nonbattle casualty rates for riflemen are about twice as high as those for gunners (MOS No. 603), the next highest group. Some of the implications of high casualty rates in rifle battalions were discussed in HEALTH for 31 August.

The strong relationship between battle and nonbattle casualties is evident from the rates in the accompanying table, and even more apparent when one studies the experience of the infantry alone. Combat may be said to increase exposure to a wide variety of diseases and injuries, to hinder the precautionary measures usual under non-combat conditions, and to impair physical and psychological reserves to a degree which renders the individual more susceptible to disease and injury. The variations by MOS merely serve to illustrate this general truth. The accompanying chart portrays the relationship in diagrammatic form. Each dot gives the coordinates of a particular MOS with respect to both battle and nonbattle casualty rates. Their tendency to lie along a line reveals a strong relationship which is summarized by the solid line which has been drawn through the points on the assumption that the relationship is straight-line in character. The MOS data provide a more sensitive test of the idea of such a relationship than is usually available in comparisons of the rates for entire divisions. Unless the underlying environmental hazards are fairly similar, the relationship may be obscured.

The admissions to a sample of evacuation hospitals, and to one convalescent hospital, were tabulated by cause in order to show an approximate breakdown of admissions by type. These data, as summarized below, understate the importance of neuropsychiatric disease and of venereal disease, for special centers were set up for the triage and treatment of these cases at the army level and these centers were not included in the sample of hospitals studied. This fact also explains in part why the percentage of neuropsychiatric patients returned to duty appears to be so low. Another reason is that the most readily salvageable are returned to duty from forward echelons and do not gain admission to evacuation hospitals. On the other hand, the significance of trench foot is underscored not only by its comparatively high incidence but also by the very small proportion returned to duty from Fifth Army hospitals. Malaria caused more admissions than trench foot but apparently necessitated only half as many initial replacements, according to these figures. It must be emphasized that other patients were returned to their units from base hospitals and that still others obtained different

RELATION BETWEEN BATTLE AND NONBATTLE CASUALTIES FOR CHIEF MILITARY OCCUPATIONS DURING COMBAT
RATES PER THOUSAND MEN PER DAY



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CASUALTY RATES BY MILITARY OCCUPATIONAL SPECIFICATION, FIFTH ARMY (Continued)

duty assignments, so that the totals returning to any type of duty would be much higher (see HEALTH for June). It will be recalled that 27 percent of all battle casualties and 57 percent of all nonbattle casualties returned to duty in their units, according to the analysis based on the morning reports.

APPROXIMATE INCIDENCE OF CASUALTIES BY TYPE,
AND PERCENT RETURNED TO DUTY FROM FIFTH ARMY HOSPITALS,
BASED ON SAMPLE OF EVACUATION HOSPITALS

Type of Casualty	Percent by Type	Percent Returned to Duty from Fifth Army Hospitals
<u>Battle</u>		
Killed in Action	15	0
Captured	3	0
Missing	15	0
Fragment Wound	50	16
Gunshot Wound	9	11
Battle Injury	8	36
Total	100	17
<u>Nonbattle</u>		
Nonbattle Injury	10	39
Respiratory	12	65
Malaria	11	70
Neuropsychiatric	9	16
Trench Foot	8	5
Jaundice	8	42
Neuromuscular	6	27
Gastro-intestinal	6	59
Eye, Ear, Nose and Throat	5	54
Skin Condition	4	55
Venereal Disease	4	46
Other Genito-urinary	4	31
Miscellaneous	13	41
Total	100	43

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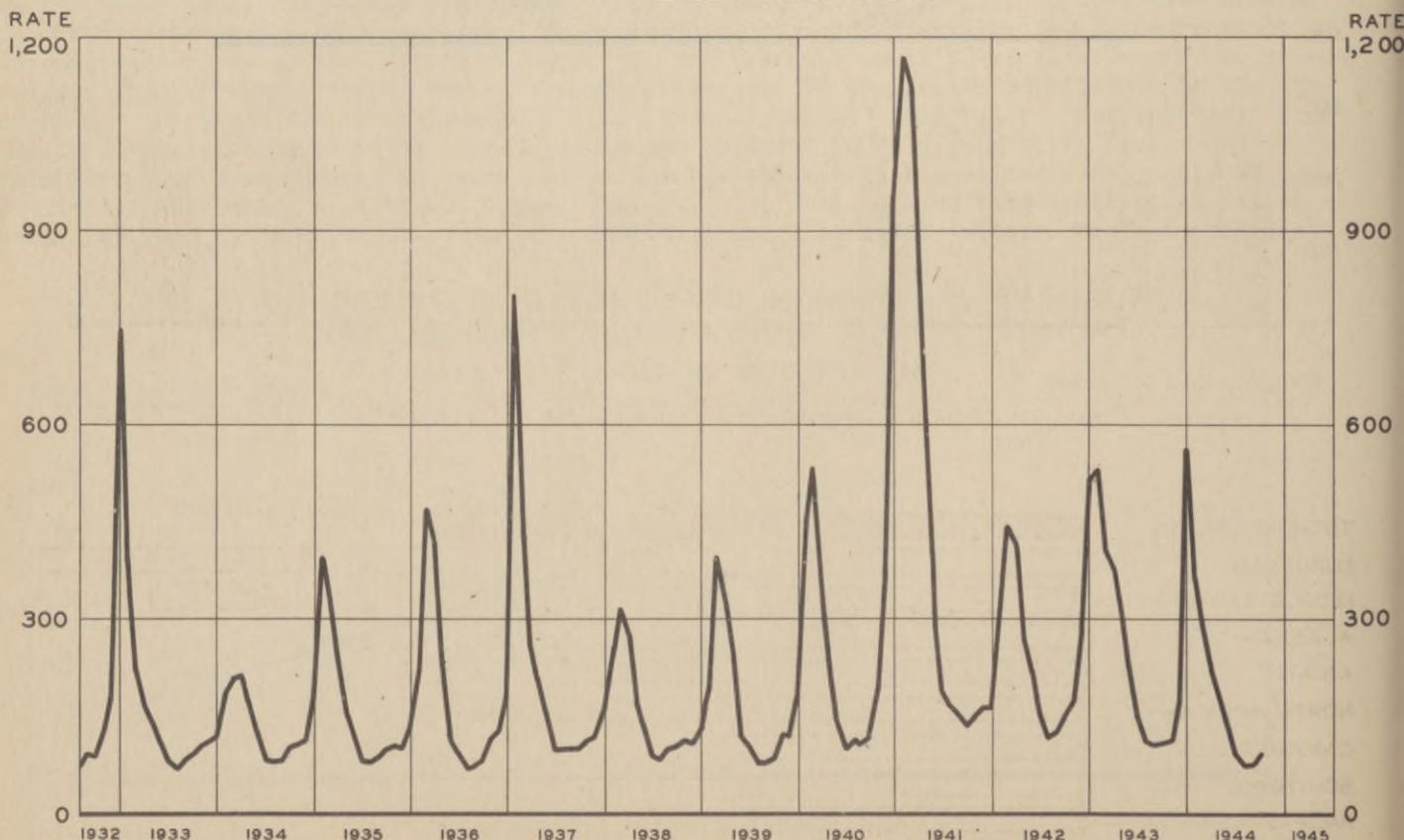
RESPIRATORY DISEASE

Each year respiratory disease takes a tremendous toll of effective manpower in the Army as well as in the civilian population, although it causes few deaths among Army personnel. Assuming that the average case loses five days, for example, a rate of 7 noneffectives per 1,000 strength is well within the range of expectation for winter months in the U. S. For a strength of 3,000,000 men in the U. S. this means that an average of about 21,000 men would be respiratory noneffectives on each day throughout this season. During the entire year ending June 1943 the probability is that something on the order of 5,000,000 man-days were lost in the U. S., and 3,000,000 overseas, or 8,000,000 in all. On the average day, therefore, the Army carried about 22,000 respiratory noneffectives. Based on the 1943-1944 experience it may be roughly estimated that 3.5 million man-days will be lost overseas between 1 October 1944 and 1 March 1945, making an average noneffective population of 23,000 men per day because of respiratory disease alone. Should the season prove unfavorable, correspondingly higher losses would be experienced. The loss might well be greater because of the greater concentration of overseas strength in the European Theater this year.

The problem of predicting the gravity of a future respiratory season is one which medical science has not yet solved. It is interesting to speculate upon the apparently cyclic character of the incidence of respiratory disease over the past decade or more, as shown below. The obvious symmetry is suggestive of a severe season in the U. S. during the coming winter, but there is no known scientific basis for crediting the four-year cycle so vividly portrayed by the chart. Earlier years do not display the same pattern. Moreover, the summer season just passed is the lowest in many years. Nevertheless, the uncertainties surrounding prognostication lend support to open-mindedness and the unfolding of the winter season will be watched with particular interest.

As revealed by data for service commands, the gross regional patterns of incidence within the U. S. are not entirely fixed, but for the past three seasons the Sixth and Seventh service commands have had consistently higher rates than the other service commands. The accompanying chart gives the service command (or corps area) experience for the last three years. The rates have been averaged so as to remove the influence of increasing strengths. The overseas picture is in general more favorable than that of the U. S. because of the geographical location of U. S. troops, but for the year ending June 1944 the rate for the British Isles was almost 50 percent higher than the average U. S. rate, the latter being exceeded

RESPIRATORY DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR
ARMY IN THE CONTINENTAL U. S.



DISEASE AND INJURY

RESPIRATORY DISEASE (Continued)

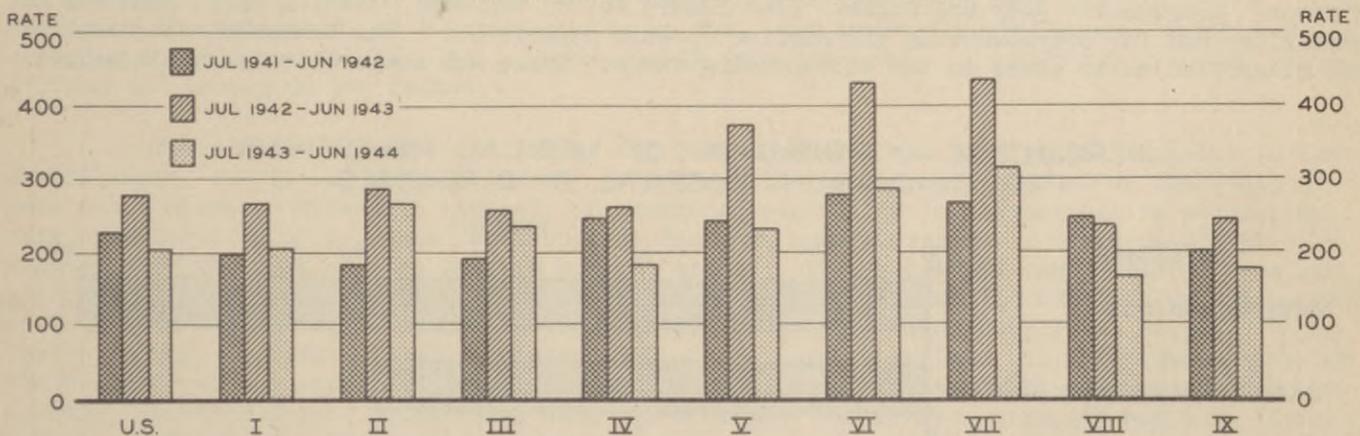
also by the rates for Alaska and for the Middle East, which includes Central Africa and the Persian Gulf Command. These rates also were obtained by averaging the monthly rates so as to obviate the influence of changing strengths.

Perhaps three or four percent of the respiratory disease in the U. S. in non-epidemic years is reported as bacterial pneumonia, and five or six percent atypical pneumonia, a poorly understood virus disease. The bulk of the admissions represent common colds, cases of influenza, and other ill-defined infections attacking the respiratory tract. For many years the problem of control has been attacked on a wide research front, but only recently have there been results of any real consequence.

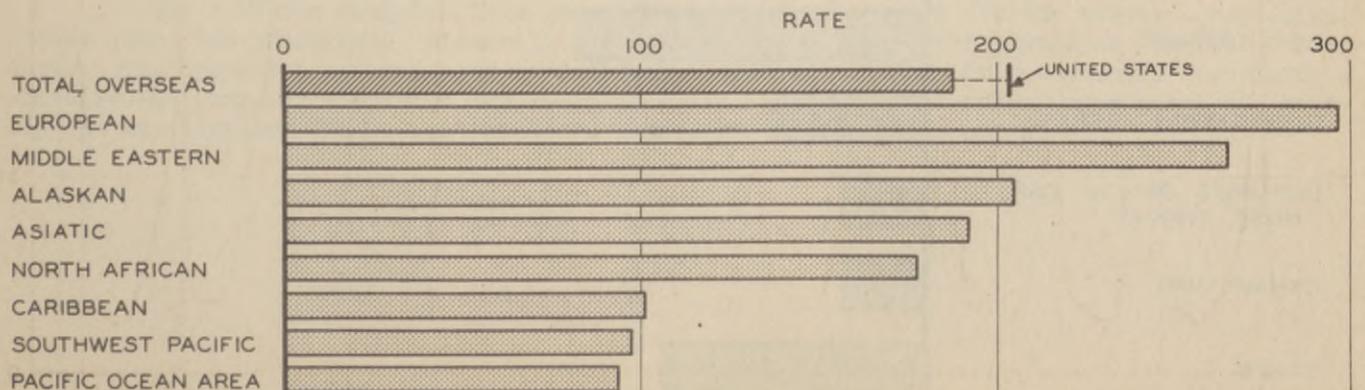
Studies conducted during the past two winters indicate that a new weapon is available for the control of some of these diseases. This is the daily administration of small doses of sulfadiazine to entire organizations for a limited period of time when an outbreak threatens. Use of this drug is considered effective against the following types of infection listed in the order of diminishing efficiency: meningococcal meningitis, scarlet fever and other streptococcal infections, rheumatic fever, and pneumococcal pneumonia. In addition, it has been shown to reduce markedly the incidence of the group of undifferentiated respiratory diseases, classified as "common respiratory disease," for many of which a streptococcus is probably responsible. Against the common cold, influenza or primary atypical pneumonia, it is ineffective except as it may reduce the incidence of bacterial complications. The method must be used with care and discretion, and only when indicated, since it is not devoid of risk. Instructions are being issued for its use by the Army. Influenza vaccine, discussed in HEALTH for July, is another agent which will shortly be available against this group. No influenza vaccine has yet been issued to field installations. It is now anticipated that limited amounts will be available by November and will be sent to theaters where epidemiological data indicate it will be most needed.

The effects of these newly available measures cannot now be judged even within broad limits, but it is expected that they will afford some measure of control for the first time in military history.

TOTAL RESPIRATORY DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR CONTINENTAL U.S. BY SERVICE COMMANDS



OVERSEAS THEATERS, JULY 1943 - JUNE 1944



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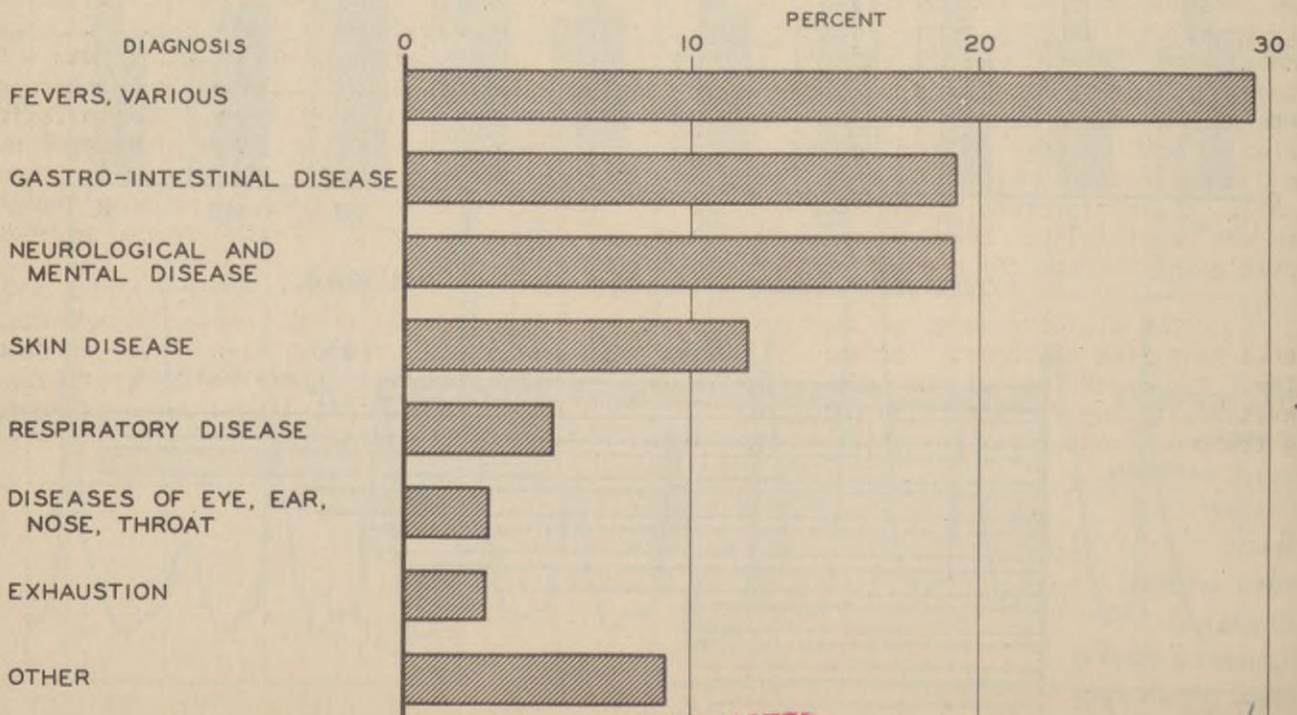
MEDICAL ASPECTS OF BIAK OPERATION, SCHOUTEN ISLANDS

In many ways the recent operation against Biak may be taken as representative, on a small scale, of the problems to be encountered in the westward push against the Japanese. The operation was conducted by the Hurricane Task Force, with an apparent strength of roughly 20,000 ground troops and service troops, reinforced later by two combat teams with a total strength of about 5,000 men. The amphibious assault was made on 27 May and the chief military objective was the Mokmer Drome. The initial resistance was such that nearby Owi Island was occupied in order to build an airfield for operational purposes. In addition to divisional medical units, the task force included an evacuation hospital, a malaria survey unit, two malaria control units, and three portable surgical hospitals. The evacuation hospital and at least two portable surgical hospitals were landed in a matter of hours following navel and air bombardment, and assault by ground troops. The record of hospital admissions suggests initially heavy resistance followed by fairly steady opposition until only mopping-up operations remained at the end of June.

The battle casualty experience was not especially severe. The medical history of the 41st Division gives 237 killed, 1,747 wounded, 123 injured in action, and 19 missing, or a total of 2,126 battle casualties. Related to the average strength of the entire reinforced task force over the period of 35 days, the number of wounded represents a daily rate of 2.3 per 1,000 strength, about half the current divisional rates of 4.1 among combat units in northern France. Only 62, or 3.5 percent of those wounded, are reported to have died of wounds. The portable surgical hospitals received most of their cases in less than six hours after wounding, although in some instances enemy fire prevented efforts to bear patients to these units until darkness provided a cover. The portable surgical hospitals were at times within range of mortar-fire, and one of them was at one time so badly flooded with casualties that it was possible only to perform life-saving surgery, relieve shock, and transport patients to the evacuation hospital as quickly as possible. Patients were kept on litters in the portable surgical hospitals as a protective measure against enemy gun-fire. One installation, reporting on a sample of patients, observed that half the wounded had been hit by bullets and half by shell-fragments. Sulfa drugs and penicillin were available and used as needed.

Judging from hospital admissions, disease caused more admissions than battle casualties, 52 percent of the admissions to the evacuation hospital having been for disease. The reports covering the period ending 30 June make no mention of scrub typhus, which became such a severe problem in July and August (see HEALTH for 31 August), causing many hundreds of admissions and far overshadowing the earlier disease experience. The admissions to hospital are classified as to cause in the accompanying chart. There was comparatively little malaria

PERCENTAGE DISTRIBUTION OF MEDICAL ADMISSIONS TO EVACUATION HOSPITAL, BY DIAGNOSIS



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MEDICAL ASPECTS OF BIAK OPERATION, SCHOUTEN ISLANDS (Continued)

and most of the cases which occurred were attributed to relapses in the face of physical exhaustion and to probably poorer atabrine discipline under combat conditions. Mosquitoes presented no great problem of control, and atabrine was taken prophylactically. Diarrheal disease occurred widely but in mild form. It was especially prevalent in areas previously occupied by the enemy. All reports speak of vast numbers of flies in these installations. Rigid adherence to field sanitation principles in messing, garbage disposal, and personal hygiene are said to have checked the spread of diarrheal disease. Neuropsychiatric disease was chiefly of the combat exhaustion and hysterical type, and there were about seven surgical admissions for each neuropsychiatric admission. One unit report makes the observation that neuropsychiatric reactions were frequent among men with previous combat experience, but that a day or two of rest in a rear area sufficed "to restore mental equilibrium and efficiency".

Although medical supplies were reported to be adequate at all echelons, there was a serious shortage of hospital linen in the evacuation hospital when its location interfered with its establishment of adequate laundry facilities. The division surgeon reports also that the efficiency of the regimental and battalion medical detachments was in some cases compromised by lack of mobile load-space for equipment and supplies. Discarding of supplies by exhausted personnel carrying heavy loads was also observed. The comment is also made that the medical maintenance unit does not fit the needs of the first 30 days of an operation of this type although it appears to be adequate once conditions have become stabilized. The evacuation of the wounded from certain areas was rendered extremely difficult by the terrain, from eight to sixteen men often being required to carry one litter case from the perimeter in the ridges to battalion aid stations. Plasma, as well as dressings, were frequently given in the perimeter. Litter-bearers carried their own weapons but occasionally enjoyed armed infantry protection and direction. Despite these handicaps, front-line evacuation never broke down, and subsequent evacuation by jeep ambulances and by water was relatively easy. From the evacuation hospital, patients were returned to the rear by means of LST's and later by air and by hospital ship. The LST's were equipped for surgery. Initially a 15-day policy was in effect but this was later lengthened. The problem of evacuation was really acute during the first three weeks, crowding of hospital facilities being such that patients were evacuated who normally would have been held in the evacuation hospital. On Z+20 a convalescent type of camp was organized and this helped materially to clear the hospital. On Z+24 the first air evacuation was established, and on Z+29 there was a lift by hospital ship. When the decision was made, after initially heavy resistance had been encountered on Biak, to build an airstrip on nearby Owi, it was decided to move the evacuation hospital there. This permitted the selection of a superior site on Owi, but great difficulty was experienced in securing a bulldozer to clear the jungle growth from the area. On Z+15 the hospital closed on Biak and opened on Owi Island.

The sanitation practiced during the Biak operation has been judged superior to that at Hollandia, but it was not sufficient to prevent the considerable amount of diarrheal disease noted above. Effective control of beachhead sanitation in combat can be accomplished only by allocation of personnel and supplies for that special purpose. This should be coordinated with the work of the malaria control units. It was assumed that no water was safe without boiling or chlorination. The water points on Biak were at the beaches, and water had to be hauled inland as the operation progressed. On Owi the water supply was found to be inferior to that on Biak. Food consisted of C, K and 10-in-1 rations in ample quantities but the C and K rations especially were found monotonous and unpalatable by the troops. Consequently, the appropriate quantities were not consumed and reserve strength and body weight were not maintained. Hospital patients recently evacuated from the forward areas were observed going through the mess line two or three times.

The division surgeon lays great stress on the success of the casual camp established near the beachhead, primarily for patients awaiting transportation back to their units. The operation of the camp effectively removed casualties from the area, providing a convalescent camp for otherwise ambulatory hospital patients, and affording a means of grouping the men together for re-equipment and transport back to their units.

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NONBATTLE INJURIES IN NORTH AFRICA

Recent technical medical reports from the North African Theater indicate an increasing awareness of the high toll of manpower exacted by nonbattle injuries and of the possibilities of effective measures for their control. Since accidents are for the most part preventable it is hoped that such studies of their types and causes will provide the foundation for sound and adequate programs of control in all overseas theaters. As reported in HEALTH for July such a program has already been instituted in the Southwest Pacific on the basis of similar observations but it is yet too early for any estimation of its success.

The North African Theater ranks fourth among overseas theaters in incidence of nonbattle injuries. During 1943 its rate of 146 admissions per thousand strength per year was ten percent above the average of 135 per thousand for all theaters and for the first half of 1944 its rate of 145 was 25 percent higher than the overseas average. Comparative admission rates for individual theaters and the Continental U. S. are shown in the panel below for 1943 and for the first half of 1944. Although the frequency of injury declined in most theaters during 1944, there was no change in the rate for North Africa. Throughout this period, of course, North Africa was the most active combat theater.

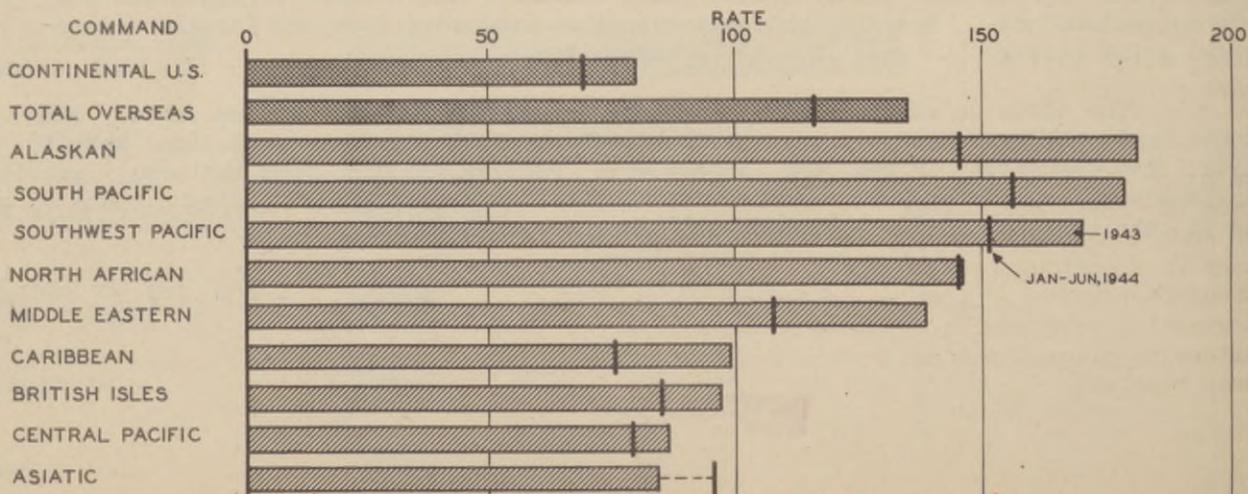
During 1943 nonbattle injuries cost the theater about 1,220,000 man-days, which represents an average loss of 3,300 men on each day of the year, or the equivalent of nearly three divisions for one month. In comparison, 1,170,000 days are estimated to have been lost by those wounded in battle and 4,970,000 by disease patients. Over 14 percent of all patients evacuated from North Africa to the U. S. between November 1943 and June of this year were nonbattle injury patients. They represented 5.5 percent of all the theater admissions for nonbattle injury while only 3.6 percent of injury admissions to all theaters were evacuated to the United States. The number of men evacuated for nonbattle injury numbered about 3,100 or 7.1 per thousand theater strength for NATO and 3,400 or 2.2 per 1,000 strength per year for all other theaters. In addition approximately 1,700 deaths from accidents occurred in North Africa during 1943, or 3.5 percent of the nonbattle injury admissions.

A survey made by the theater to explore the causes of nonbattle injuries indicates that more than half result from falls or involve vehicles of one kind or another. A summary of these data appears in the following table.

PERCENTAGE DISTRIBUTION OF NONBATTLE INJURIES BY CAUSATIVE AGENT, NORTH AFRICA

Cause	Percent
Falls	29.5
Vehicles	23.1
Gunshot wounds, explosions	11.7
Brawls and fights	9.5
Burns (principally stoves or gasoline fires)	6.6
Falling objects, machines, miscellaneous	19.6
Total	100.0

NONBATTLE INJURY, ADMISSIONS, PER THOUSAND MEN PER YEAR
OVERSEAS THEATERS 1943 AND 1944



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DISEASE AND INJURY

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NONBATTLE INJURIES IN NORTH AFRICA (Continued)

When noncombat aircraft accidents are excluded, the North African Theater has experienced a higher average mortality rate from nonbattle injury than any other theater. Deaths from injuries were more than five times those for disease during 1943. Analysis of a sample of 607 nonbattle injury deaths (excluding homicides and suicides) occurring in the theater from January through May reveals that the greatest proportion resulted from airplane or automobile accidents. The other categories may be read from the table below:

ACCIDENTAL DEATHS BY CAUSATIVE AGENT, NORTH AFRICA January through May 1944

Causative Agent	Deaths	
	Number	Percent
Airplane	184	30.3
Automobile	132	21.8
Firearms	72	11.9
Explosive	40	6.6
Falls	19	3.1
Drowning	31	5.1
Burns	22	3.6
Miscellaneous	<u>107</u>	<u>17.6</u>
Total	607	100.0

A tabulation of all available individual records on nonbattle injuries in the North African Theater during the first nine months of 1943 shows that wounds, sprains and strains, and fractures represent the most frequent types of injuries. The percentages of admissions with each type of injury are given in the following table:

PERCENTAGE DISTRIBUTION OF NONBATTLE INJURIES BY TYPE, NORTH AFRICA January through September 1943

Type	Percent
Wounds *	37.6
Sprains and strains	20.1
Fractures	15.9
Burns and blisters	8.6
Bites and stings	3.7
Crushing	3.1
Dislocations	2.4
Other	<u>8.6</u>
Total	100.0

* Lacerations, abrasions, contusions, etc

Although dislocations embrace only a small segment of admissions, they are responsible for a loss of more than 30 days per case, the average being in the neighborhood of 20 days. Fractures and burns also cause more noneffectiveness than the average injury. The case fatality for this entire group of admissions was approximately 3.5 percent, partly because of immediately fatal accidents, e.g. drowning, suicide, and homicide, but also because of the high case fatality rate of 22 percent for crushing injuries.

The importance of accident prevention as a means of conserving manpower can hardly be given too much emphasis, although the difficulties of instilling safety-mindedness in the face of combat conditions are readily appreciated. The problem is common to all theaters and of such a nature that only decisive command action can be effective in reducing noneffectiveness from accidents. In the Continental U. S. where incidence of nonbattle injury is only about 60 percent of that among overseas troops, the War Department has directed that accident prevention programs be established at all posts, camps, and stations. It is hoped that the extensive program planned by the Southwest Pacific may yield valuable lessons for other overseas theaters.

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DISEASE AND INJURY

DENTAL TREATMENT AND ESTIMATED REQUIREMENTS

A recent study of the probable needs for extractions, restorations, and dentures among Army personnel in the U. S. reveals that the backlog of dental work evident in 1942 and early 1943 is now virtually dissipated. A dental survey of inductees made by the American Dental Association furnishes the basis for the estimated needs, together with data on the average accrued needs of men already in the service. The survey employed a sample and the resulting estimates of needs must be regarded as highly tentative. Army surveys have yielded rather lower estimates but are regarded as less indicative of actual need.

The estimates shown in the accompanying table suggest a large backlog of unaccomplished dental work in 1942. This accords with the known clinical facts and is believed to extend also to the early months of 1943. Thereafter, however, the backlog was rapidly reduced. At the end of June 1944 the calculated backlog represents about 10 percent for extractions and 13 percent for restorations, the calculated need for dentures having been met. These differences are well within the limits of the error of estimation. It should also be borne in mind that certain work which would now be done in the U. S. prior to overseas movement was at one time partly done overseas. This portion of dental work does not, of course, appear in the U. S. figures.

COMPARISON OF ESTIMATED DENTAL NEEDS WITH DENTAL WORK ACCOMPLISHED,
CONTINENTAL U. S.

Type of Treatment	1942	1943	1944*	Total
<u>Extractions</u>				
Estimated Need	6,556,000	3,684,000	1,117,000	11,357,000
Accomplished	3,030,000	5,316,000	1,826,000	10,172,000
<u>Restorations</u>				
Estimated Need	22,280,000	15,158,000	7,811,000	45,248,000
Accomplished	7,115,000	20,898,000	11,390,000	39,403,000
<u>Dentures</u>				
Estimated Need	736,000	400,000	105,000	1,241,000
Accomplished	139,000	787,000	470,000	1,396,000

* First Six Months.

HOSPITALIZATION

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STATUS OF HOSPITALIZATION OVERSEAS

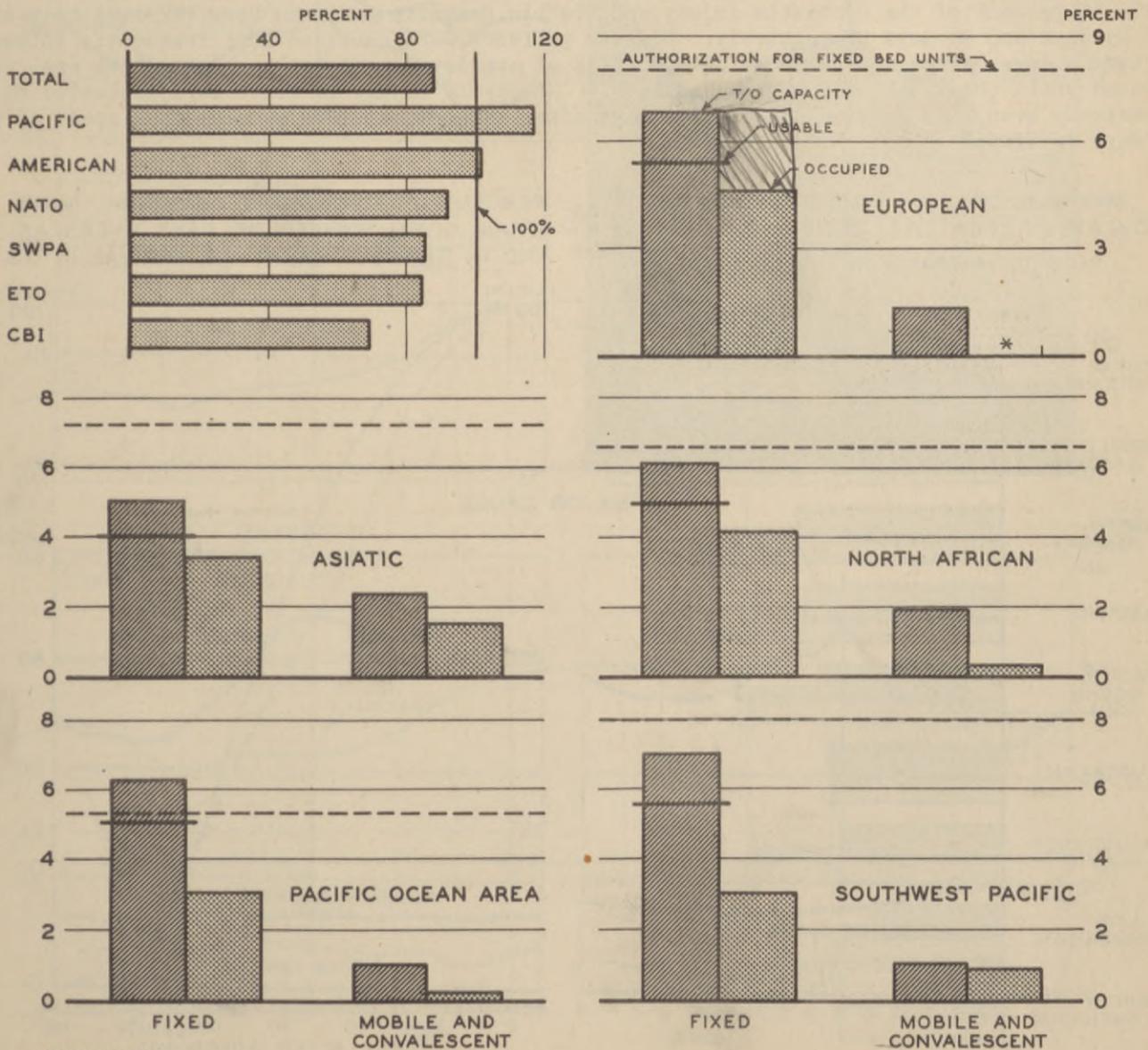
At the end of August three theaters had less than 90 percent of their authorized T/O capacity of fixed hospitals. From 31 July to 31 August the average for all overseas theaters advanced from 85 to 88 percent of authorization. The first panel of the chart compares the various theaters from this standpoint. The authorization shown for the Asiatic Theater includes only 4,560 beds (8 percent of the ceiling strength of 57,000) for the Chinese Army in India, although the reported strength of the Chinese Army in India was 85,000 at the end of August. The T/O capacity of fixed beds in this theater advanced from 60 to 70 percent of authorization during August. There was a marked improvement in the facilities available to the Southwest Pacific because of the reorganization discussed in HEALTH for 31 August. Although the reorganization is not yet complete, the facilities are available for an additional 6,250 beds and these have been added to the count for 31 August. This means a rise in capacity from 72 percent for 31 July to 86 percent of authorization at the end of August.

The other panels summarize the hospital situation in each of the major theaters at the end of August. Data on bed occupancy are based upon telegraphic reports and are preliminary. A special report for the European Theater dated 29 September gives a total of only 106,000 fixed beds operating in comparison with 128,900 fixed bed units present in the theater on 31 August. Occupancy of fixed beds advanced from 4.6 to 5.3 percent of strength during the first four weeks of September.

STATUS OF HOSPITALIZATION OVERSEAS, 31 AUGUST 1944

FIXED T/O CAPACITY AS PERCENT OF AUTHORIZATION

AVAILABLE AND OCCUPIED BEDS



* Not Available.

HOSPITALIZATION

SECRET

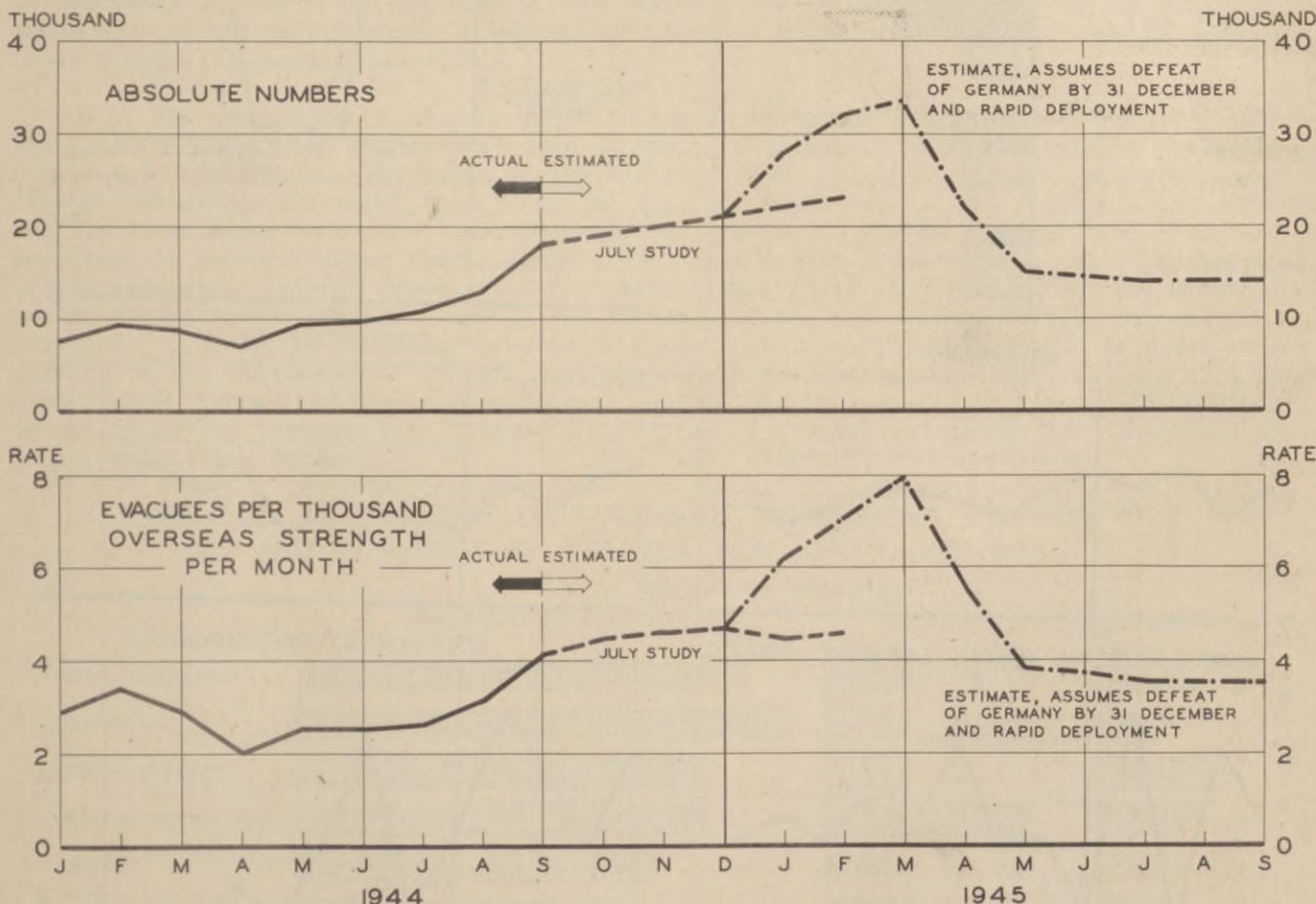
TREND OF EVACUATION FROM OVERSEAS

The final report for August confirms the preliminary estimate of 13,000 evacuees to the U. S. given in HEALTH for August. For September the provisional figure is 18,000, there having been a 50 percent increase in evacuations by sea. The proportion of air evacuees is discussed elsewhere in this issue. The preliminary estimate for September is about 1,000 higher than the forecast made in July. Recent estimates made by the various overseas theaters, especially the European Theater, suggest that the July forecasts may be somewhat low. A revision will be shown in the next issue of HEALTH. Prisoner of war patients are not included in these counts.

Despite the increase in evacuation during September, the backlog of patients awaiting evacuation to the U. S. rose to about 11,000, of whom about 3,000 were prisoners of war. For the European Theater the backlog of Army patients almost doubled. Insufficient hospital ship capacity has been made available to this theater for evacuation and returning troop ships have not in the past been fully employed for this purpose. In view of the general shortage of hospital ships (see HEALTH for July) it would seem imperative that maximum use be made of returning troop ships for purposes of evacuation.

The July forecast, shown in both absolute and relative form in the charts below, has been extended through February 1945 on the assumption of continued hostilities in Europe. The peaked lines, representing an estimate of the way in which the defeat of Germany may affect the rate of evacuation, were described in HEALTH for August. It is necessary to assume a particular date in order to illustrate the argument, and 31 December 1944 must be regarded as a purely arbitrary choice. The estimates do not take into account any augmentation of the expected number of evacuees from the Pacific areas which might occur as a prelude to the opening of large-scale offensive action.

ACTUAL AND ANTICIPATED EVACUATION OF PATIENTS FROM OVERSEAS



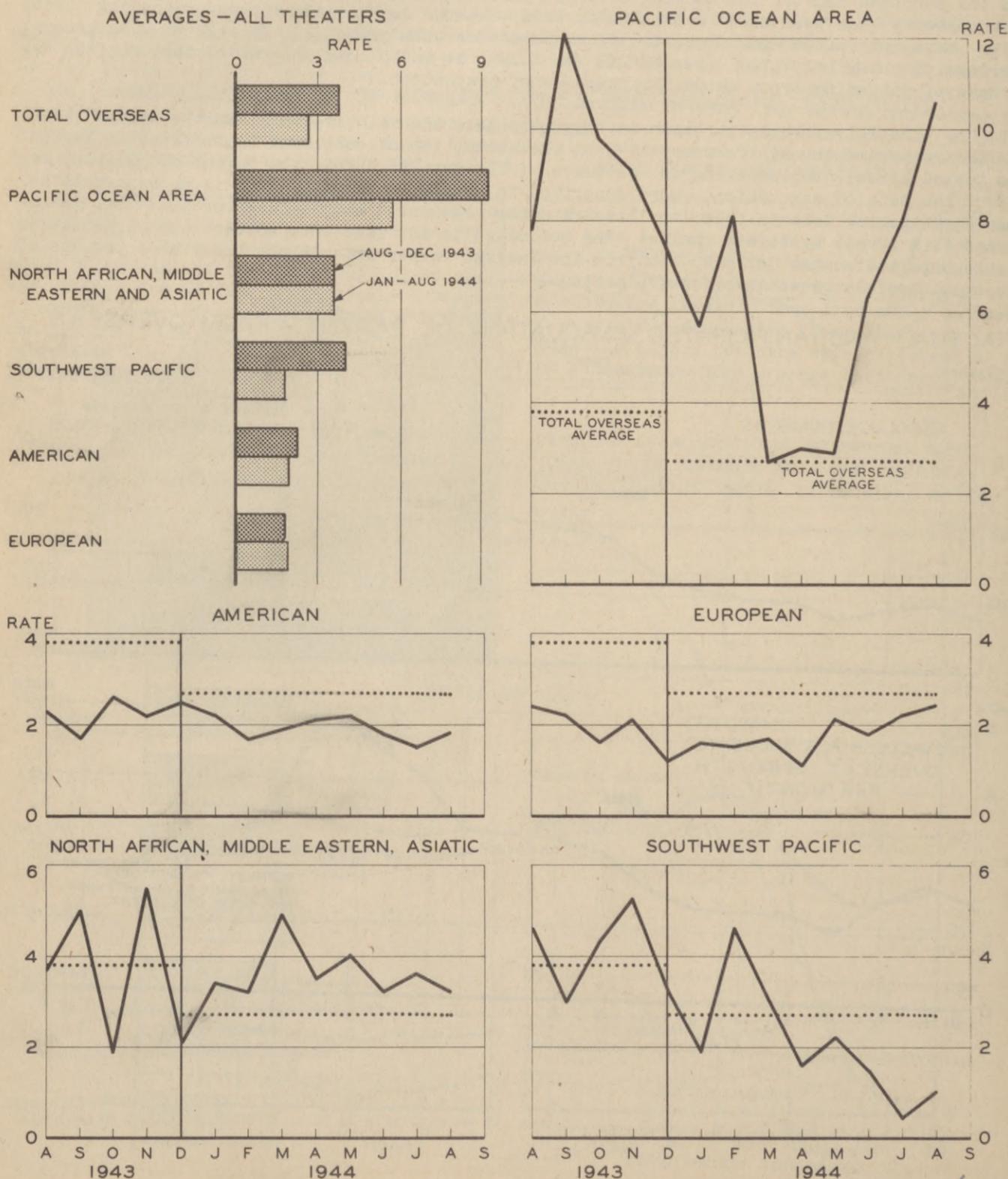
HOSPITALIZATION

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TREND OF EVACUATION FROM INDIVIDUAL OVERSEAS THEATERS

The theater components of the total evacuee rates shown on the previous page appear in the chart below. Each theater or group of commands is compared with the average experience for all theaters for the periods indicated in the top left-hand panel. The horizontal lines in the other panels represent the average rates for all theaters for the same time periods. During August the European Theater increased only slightly, remaining well below the average for all theaters. The evacuation rate for the Pacific Ocean Area rose sharply during July and August, and a sharp reversal in the trend of evacuation from the Southwest Pacific is anticipated.

EVACUEES PER THOUSAND STRENGTH PER MONTH, OVERSEAS THEATERS



HOSPITALIZATION

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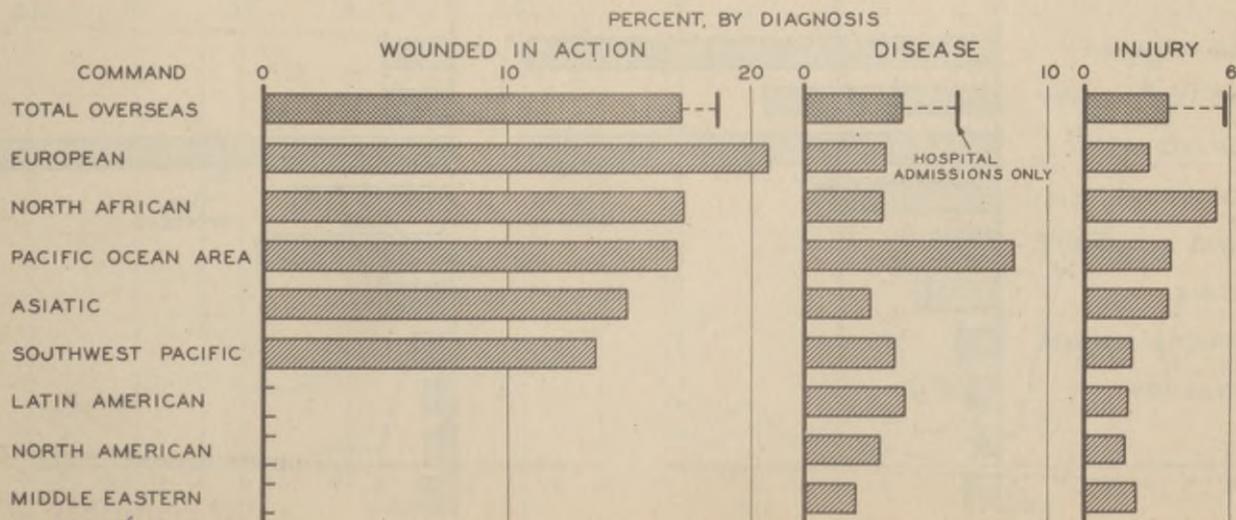
PERCENTAGE OF OVERSEAS ADMISSIONS EVACUATED TO THE U. S.

Until it becomes possible to trace through to their disposition a set of admissions occurring at a particular place and time, estimates of the proportion of overseas admissions who are evacuated to the U. S. are necessarily tentative. The importance of such estimates for planning purposes in connection with hospitalization and evacuation invited further refinement of data previously presented (see HEALTH for May). Detailed information on the evacuees received during April through June 1944 has been combined with the figures for November 1943 through March 1944 as a basis of estimation.

Use of a longer period of time involves some hazard in that trends may be missed, but it is highly advantageous in minimizing the importance of any error in the lag which must be assumed between admission and evacuation. For the present study a lag of two months was employed for disease admissions and three months for both battle and nonbattle injury. Comparison of admissions and evacuees then leads directly to the percentages given below in graphic form by theater and by diagnosis. Admissions are used in the sense of admissions to both hospital and quarters because the proportion of admissions reported as hospitalized in the Statistical Health Report displays less variation among theaters but the data are also shown for all hospital admissions overseas. It is of interest to note that for hospital cases only the percentages are 19 for battle casualty, 6.4 for disease, and 5.9 for nonbattle injury, in contrast with 17, 4.1, and 3.5 for all admissions. Except for battle casualties, these data on hospital admissions are probably not closely comparable with those for World War I because of differences in the proportion of total admissions who were hospitalized. The World War I percentages for hospital cases only are 30 percent for wounded (excluding gassed) and 7.5 for nonbattle causes, but the analysis by Love states that "The unnecessarily high percentage of cases returned to the Zone of the Interior from the American Expeditionary Forces was due largely to the return of many recovered patients after the Armistice, who would ordinarily have been retained for duty in the Theater of Operations. If it is desired to conserve manpower in the Theater of Operations our experience indicates that it will not be necessary to return to the Zone of the Interior more than 3 percent of the cases of disease and nonbattle injuries, 6 percent of those wounded by war gases, and 20 percent of those wounded by gunshot missiles."

The proportion of disease patients evacuated to the U. S. has been notably high for the Pacific Ocean Area, almost 9 percent in fact, although it is hardly safe to project this figure into the future. Exclusion of the Pacific Ocean experience lowers the percentage of disease admissions evacuated to 3.3 for the period under review. For nonbattle injuries the Pacific Ocean experience is not exceptional, but the North African figure of 5.5 percent is more than 50 percent higher than average. The chief combat theater during this period, North Africa evacuated only 17 percent of its battle casualties as recorded on the Statistical Health Report to The Surgeon General, and virtually fixed the average of 17.2 percent for all theaters. For future planning no estimate under 20 percent is believed to be safe, and reduction in the evacuation policy of the European Theater may necessitate the use of a somewhat higher figure for battle casualties. As the war is seen to be drawing to a close in Europe it may be expected that larger proportions of disease and nonbattle admissions would be evacuated than formerly.

EVACUEES AS PERCENT OF OVERSEAS ADMISSIONS TO HOSPITAL AND QUARTERS, BY THEATER, NOV 1943 - JUNE 1944



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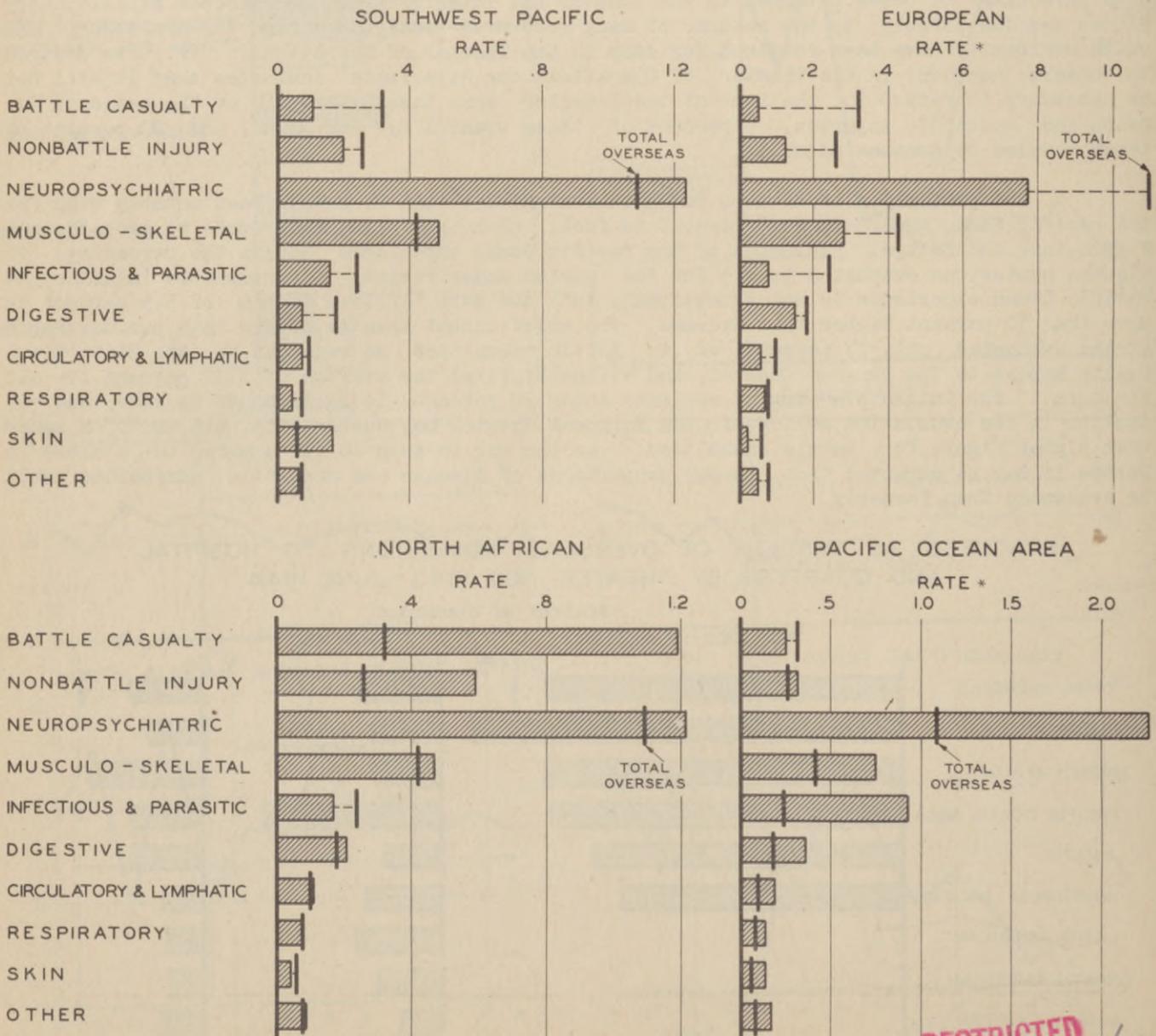
EVACUATION FROM OVERSEAS, BY CAUSE

The data shown on the preceding page as a percent of admissions are given below in rate form by diagnosis for the four major theaters. In every theater neuropsychiatric diagnoses constituted the major category in the classification employed below, taking precedence over battle casualties. For the entire eight-month period 38 percent of the evacuees were neuropsychiatric patients, the total having been of the order of 25,000 patients, it is estimated. Even for North Africa, the most active theater during this period, almost 30 percent of the evacuees were neuropsychiatric patients. It may be expected that, as evacuated battle casualties increase in number, the relative proportion of neuropsychiatric patients will decline somewhat. Battle casualties may be expected to approach 50 percent of all evacuees, and surgical cases of all kinds about 55 percent.

Each panel below gives the experience of a particular theater against the background of the average overseas experience, shown in heavy outline. It should be mentioned, however, that the detailed medical reports give totals which are about 10 percent short of the transportation reports, used in presenting evacuee data in HEALTH, and have been adjusted to agree with them. Most of the difference arises from data on the Pacific Ocean Area. As estimated, the Pacific Ocean experience is notable on many counts, but especially for the numbers of evacuees with infectious and parasitic diseases, and skin diseases. A similar but less marked pattern is evident in the experience of the Southwest Pacific.

EVACUEES PER THOUSAND MEN PER MONTH

OVERSEAS THEATERS, NOVEMBER 1943 - JUNE 1944



* Different scales used.

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HOSPITALIZATION

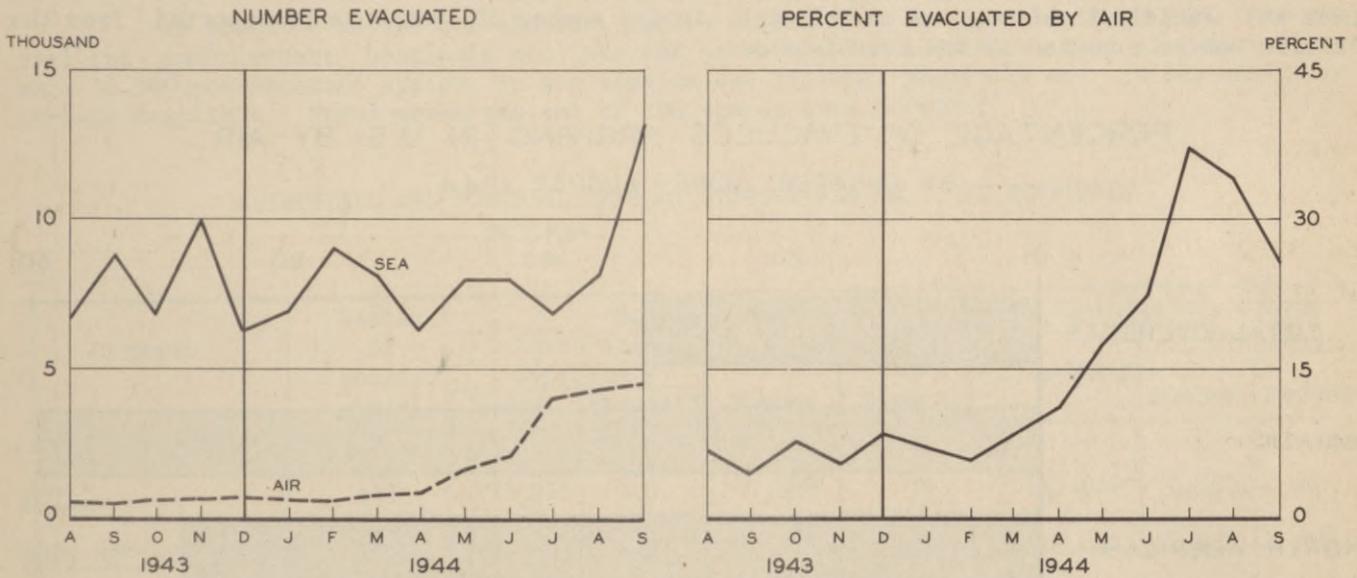
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AIR EVACUATION FROM OVERSEAS THEATERS

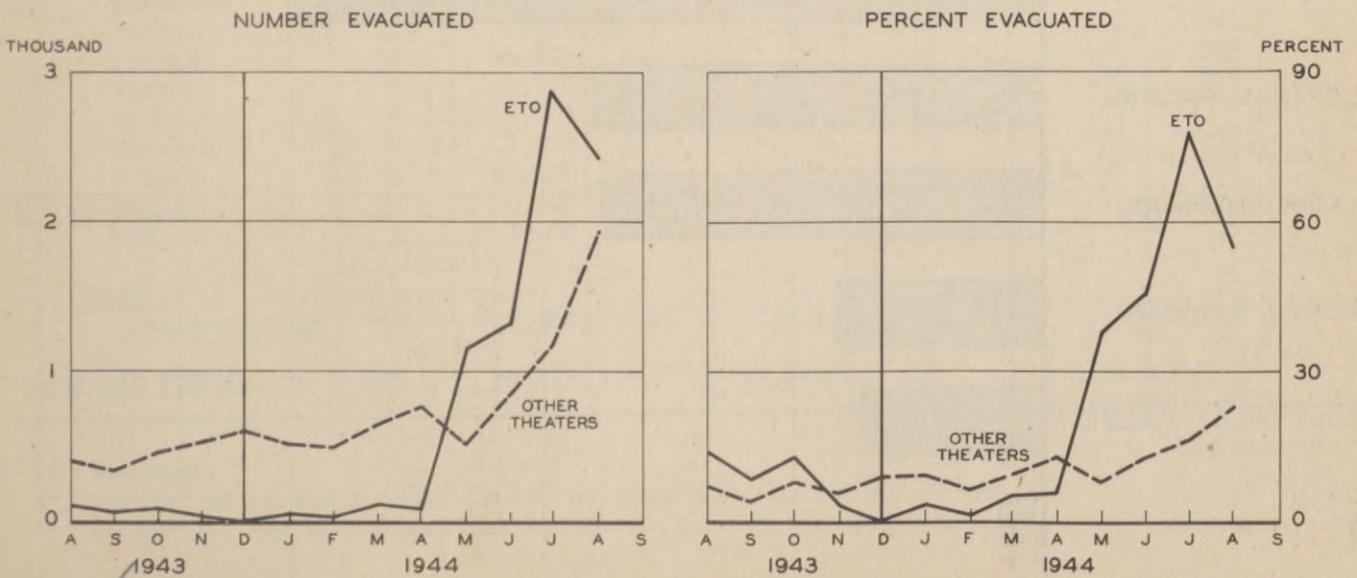
Air evacuation of patients from overseas theaters to the Zone of the Interior is accomplished by the Air Transport Command, Army Air Forces. Decision as to the use of aircraft for transporting patients rests with the theater commander, who is authorized a specified amount of air tonnage per month, any part of which he may divert to transportation of sick and wounded. Priority boards established by each theater commander determine priorities for cargo, passengers, and casualties. Patients to be evacuated are usually concentrated at Air Transport Command bases and brought to the U. S. through terminals of the ATC wings at which are located AAF bases with facilities for immediate hospitalization. From these debarkation points casualties are distributed to the various general hospitals within the U. S.

Prior to April the proportion of evacuees arriving in the United States by air was consistently below ten percent. In April the trend turned sharply upward, largely because of increased employment of air evacuation by the European Theater. In July, 37 percent of all evacuees from overseas were transported by air. The slight drop in August reflects a decline in the proportion evacuated by air from the European Theater, but for all other theaters the percentage continued to rise. During September evacuation by sea occurred on an unprecedented scale, but evacuation by air maintained its previous volume, according to provisional estimates. The upper left-hand panel shows the number of evacuees arriving in the U. S.

PATIENTS EVACUATED TO THE U.S. BY SEA AND BY AIR FROM ALL THEATERS



BY AIR FROM ETO AND FROM ALL OTHER THEATERS



HOSPITALIZATION

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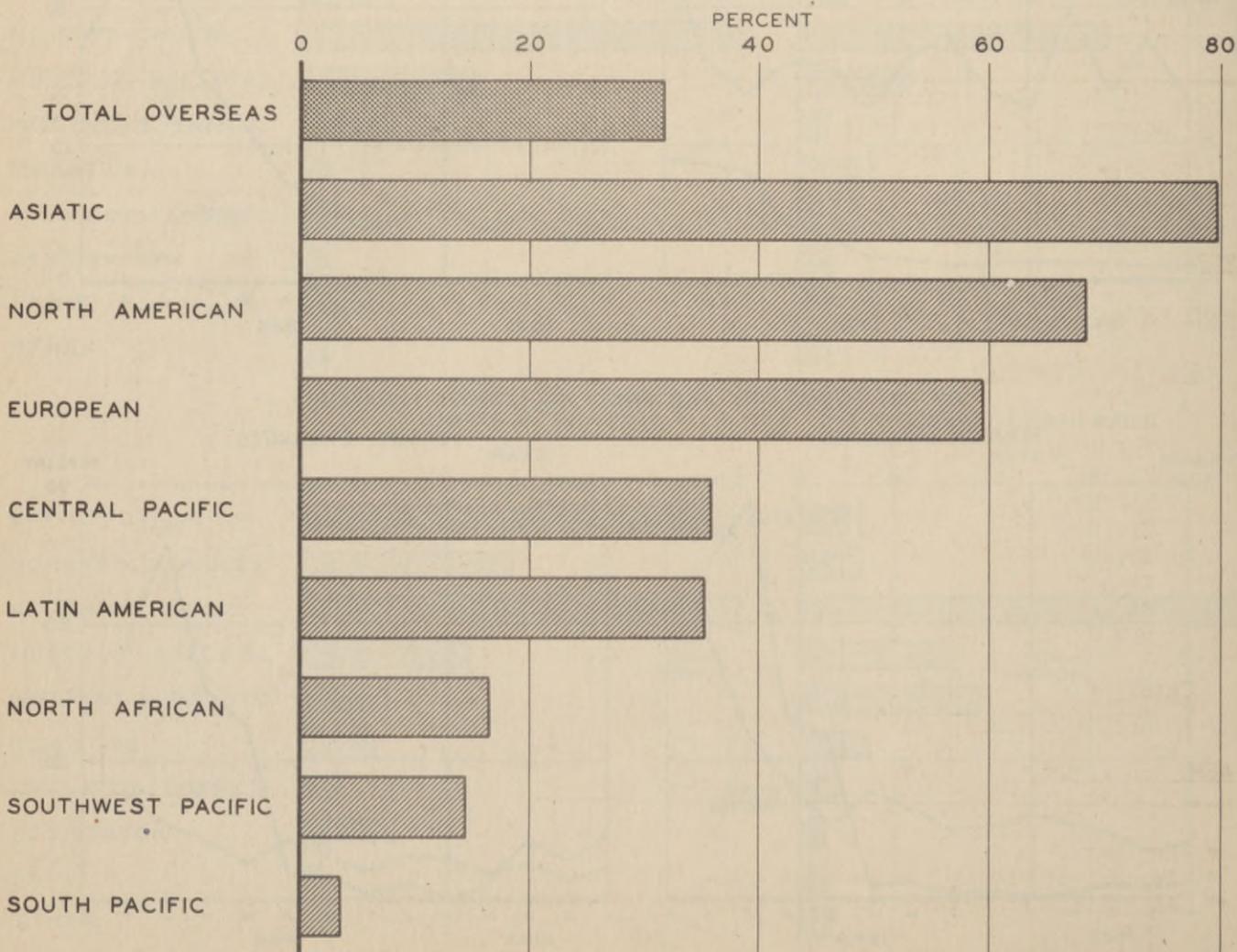
AIR EVACUATION FROM OVERSEAS THEATERS (Continued)

separately by sea and air each month since August 1943. Until September increases in the number evacuated from overseas reflected chiefly the movement of patients by air, the sea component having remained fairly constant. The top panel on the right gives the percentage of all evacuees arriving by air during the same period. In order to discount the effect of the tremendous increase in air evacuation from the European Theater, the lower panels on the previous page give similar information separately for the European Theater and for all other theaters. Records of the Air Surgeon for June, July, and August 1944 reveal that 65 percent of all air evacuees to the Zone of the Interior were ambulant patients, the remaining 35 percent being litter patients. These figures compare with 82 percent ambulant and 18 percent litter patients among evacuees by water. Disease was the cause for evacuation in 51 percent, battle casualty in 38 percent, and nonbattle injury in 11 percent of the air evacuees during these three months. Over 96 percent of those evacuated were U. S. Army personnel, the rest being Navy, Marine, or civilian patients.

The theaters vary widely in the extent to which they employ aircraft in the evacuation of patients. The Asiatic Theater evacuated an average of 80 percent by air from June through August while only 4 percent of the evacuees from the South Pacific were transported by air. The chart below shows the percentage of all evacuees who arrived by air from individual theaters during this period. Data for the Middle East are based on fewer than 100 cases and have been omitted for this reason.

The addition of C-54 transport planes to the Atlantic and Pacific Divisions of the Air Transport Command has recently increased the capacity for air evacuation from the European and Pacific theaters. A marked rise in the number of patients transported from the Pacific can be expected in the near future.

PERCENTAGE OF EVACUEES ARRIVING IN U.S. BY AIR
BY THEATER, JUNE - AUGUST 1944



HOSPITALIZATION

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STATION AND REGIONAL HOSPITALS

At the end of September there were 150,000 beds authorized in station, regional and convalescent hospitals, constituting 4.3 percent of troop strength served, including prisoners of war. Regulations authorize station hospitalization at 3.5 percent of troop strength served and regional hospitalization at an additional 0.5 percent of troop strength served, or 4 percent in all. The excess of 0.3 percent is attributable to three factors:

1. Reductions in bed authorizations lag behind declines in troop strength. In view of the uncertain fluctuations of troop strength at individual posts, some lag is inevitable.
2. Station hospitals under the jurisdiction of the Chief of Transportation are included. These hospitals are maintained to meet peak loads and their authorizations depend only in part upon troop strength actually served. A second element in the formula is staging capacity.
3. Hospital beds in the convalescent hospitals are included under the appropriate major commands.

Only the Eighth Service Command is noticeably out of line. Fifty-nine percent or 88,000 of all the beds authorized were occupied, 61 percent in the ASF and 54 percent in the AAF hospitals.

In addition to the convalescent spaces attached to the general hospitals, the general and convalescent hospitals and the ASF convalescent hospitals noted elsewhere, there were 16,000 convalescent spaces in the station and regional hospitals and in the AAF convalescent hospitals. Forty-seven percent of the spaces were occupied.

AUTHORIZED AND OCCUPIED BEDS AT STATION AND REGIONAL HOSPITALS

Command	Number of Hospitals	Hospital Beds				Convalescent Spaces		
		Authorized Capacity #		Occupied		Capacity	Occupied	
		Number	Percent*	Number	Percent of Capacity		Number	Percent
TOTAL	411	150,216	4.3	87,988	59	16,069	7,523	47
ARMY SERVICE FORCES	190	95,505	4.2	58,548	61	9,875	5,516	56
<u>Service Commands</u>	177	87,025	4.2	54,729	63	9,875	5,516	56
First**	6	1,031	4.5	430	42	0	0	-
Second	14	3,543	4.1	1,763	50	0	0	-
Third	13	7,911	4.1	5,390	68	200	91	46
Fourth	32	25,425	4.2	17,588	69	448	324	72
Fifth	7	4,525	3.9	3,374	75	188	122	65
Sixth	6	2,635	3.5	1,532	58	0	0	-
Seventh	28	7,046	3.7	4,319	61	897	432	48
Eighth	33	24,526	4.8	12,815	52	7,292	4,306	59
Ninth	35	9,325	4.0	6,708	72	850	241	28
MDW	3	1,058	3.3	810	77	0	0	-
<u>Chief of Transportation</u>	13	8,480	4.5	3,819	45	0	0	-
ARMY AIR FORCES	221	54,711	4.3	29,440	54	6,194	2,007	32

See text.

* Percent of strength actually served, including prisoners of war.

** Authorized bed count does not include 1,702 debarkation beds.

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HOSPITALIZATION

EFFECTIVE BEDS AND PATIENT LOAD IN NAMED GENERAL HOSPITALS

At the end of September, there were about 114,000 beds authorized in the named general hospitals. With the deduction of 12,300 beds reserved for debarkation purposes only, and 15 percent of the remainder, equivalent to 15,300 beds, as a dispersion factor, there remain only 86,600 effective beds available for the definitive treatment of patients. Dispersion, it will be recalled, represents the loss of bed capacity arising from the necessity for maintaining specialized wards, e.g. for women, surgical cases, patients suffering from contagious and infectious diseases, and the like. Against this number of effective beds, there were approximately 68,400 patients, both Army and non-Army, in the general hospitals proper, exclusive of those in the convalescent facilities, but inclusive of those on furlough, sick-leave, and AWOL.

Of the total number of patients in the general hospitals, an estimated 63,800 were Army patients, of whom 28,000 were Z.I. and 36,000 overseas patients. Of the total number of Army patients, about 8,200 were on furlough, sick-leave, and AWOL. In addition, there were approximately 4,500 non-Army patients in the general hospitals. About 1,900 were civilian and non-Army military patients who constitute a fairly constant population, and about 2,600 prisoners of war. The latter group has been steadily increasing in size.

The picture in the general hospitals proper, discussed above, is supplemented by that of their convalescent facilities and of the separate ASF convalescent hospitals (Z.I.). Of 26,162 spaces authorized, about 8,700 were occupied at the end of September.

The number of overseas evacuees now exceeds substantially the number of patients from the Z.I. With the continued accelerated flow of patients from overseas, and the fuller utilization of the regional hospital system, this excess will tend to increase. A great many of the 25,000 to 30,000 Z.I. patients in the general hospitals are surgical patients, and even if no general surgical patients had been sent to the general hospitals during the last few months, a large number of them would still be there because of the lengthy duration of stay in the hospital of such patients. While the number of battle casualties has been smaller than the number of overseas patients admitted for nonbattle reasons, the relative proportion of the former has been increasing steadily over the last six months. This increase has occurred despite the fact that large numbers of battle casualties have but recently begun to arrive from the European Theater because of the three-month lag which exists between the admission of a battle casualty overseas and his arrival in the U. S. It may be anticipated that battle casualty evacuees will exceed the nonbattle casualty evacuees in numbers within the next few months.

EFFECTIVE BEDS AND PATIENT LOAD IN GENERAL HOSPITALS,
29 September 1944

Type of Facility and Patients	Effective Beds	Patients
<u>GENERAL HOSPITALS</u>	86,569*	68,371
Army Patients		63,846
Z.I.		27,836
Overseas		36,010
Non-Army Patients		4,525
Prisoners of War		2,593
Other Military and Civilian		1,932
<u>CONVALESCENT FACILITIES OF GENERAL HOSPITALS AND ASF CONVALESCENT HOSPITALS (Z.I.)</u>	26,362	8,740

* Total beds authorized in general hospitals are 114,139. Deduction of 12,293 for debarkation purposes and 15 percent of the remainder, or 15,277, as dispersion, leaves 86,569 beds available for the definitive treatment of patients.

MISCELLANEOUS

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REJECTION RATE AT ARMED FORCES INDUCTION STATIONS

The rejection rate on pre-induction examinations can now be analyzed so as to yield a measure of the rejection rate among men being examined for the first time. For the month of August, 88 percent of all pre-induction examinations were of men being examined for the first time. Since January 1944, when pre-induction examinations were first instituted, the rejection rate on such examinations has been as follows:

REJECTIONS* PER THOUSAND PRE-INDUCTION EXAMINEES

Month	Rate
January	439
February	435
March	418
April	361
May	352
June	370
July	398
August	401

* Including those acceptable for limited service only.

Men found acceptable for limited service only have not been inducted since 1 June 1944. In the interest of comparability the above table includes with rejections those who were found acceptable for limited service only in each month.

The decrease in the rejection rate from January to May reflects the changing age composition of the men forwarded for pre-induction examination, as increasing emphasis was placed on the induction of men under age 30 and especially men under 26. In June new standards were made effective for the psychological tests of mental capacity, which had the effect of increasing the rejection rate for June and subsequent months. The increase in the rejection rate reported for mental deficiency was about 35 per 1,000 examined, but because many of those rejected for this cause would otherwise have been rejected for other reasons the effect on the overall rejection rate was probably an increase of less than 20 per 1,000. The higher level of the rejection rate in July and August may also reflect a smaller proportion of men in the very youngest age groups, since emphasis on the induction of men of these ages during the preceding months had decreased the backlog of men under 26 still in civilian occupations.

For the August 1944 pre-induction examinations the breakdown according to previous examination results was as follows:

NUMBER OF PRE-INDUCTION EXAMINEES AND REJECTIONS PER 1,000 EXAMINEES, BY PREVIOUS EXAMINATION RESULT, AUGUST 1944

Previous Examination Result	Number Examined	Rejection Rate*
NOT PREVIOUSLY EXAMINED	98,321	380
PREVIOUSLY EXAMINED		
Rejected on previous examination	12,270	572
Acceptable on previous examination	1,393	403
All previously examined	13,663	544
ALL PRE-INDUCTION EXAMINATIONS	111,984	401

* Includes men found acceptable for limited service.

In the case of men forwarded for induction, only a physical inspection is performed if the registrant has been found acceptable on a pre-induction examination within the preceding 90 days. In all other cases a complete examination is given. For induction examinations the breakdown according to previous examination results appears in the first table on the following page.

Among men forwarded for induction who had previously been found acceptable an average of 63 out of each 1,000 were rejected. In cases where only a physical inspection was given the rejection rate was only 27 per 1,000 compared with 117 where a complete re-examination was made. This latter rate may indicate the weaknesses of the previous examination or the development of disqualifying defects among men previously found fit for service. To

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REJECTION RATE AT ARMED FORCES INDUCTION STATIONS (Continued)

NUMBER OF INDUCTION EXAMINEES AND REJECTIONS PER 1,000 EXAMINEES,
BY PREVIOUS EXAMINATION RESULT, AUGUST 1944

Previous Examination Result	Number Examined	Rejection Rate
NOT PREVIOUSLY EXAMINED	8,004	303
REJECTED ON PREVIOUS EXAMINATION	973	423
ACCEPTABLE ON PREVIOUS EXAMINATION		
Reporting within 90 days and given a physical inspection	60,967	27
Reporting more than 90 days after being found acceptable and given a complete re-examination	41,008	117
All previously found acceptable	101,975	63
ALL INDUCTION EXAMINATIONS AND PHYSICAL INSPECTIONS	110,952	84

compare the causes of rejection among men examined for the first time with those for men previously examined (mostly men previously rejected) and men previously found acceptable, the following percentage distribution of rejections by cause is given:

PERCENTAGE DISTRIBUTION OF REJECTIONS, BY CAUSE

Cause of Rejection	Pre-induction Examination		Induction Examination
	Not Previously Examined	Previously Examined *	
	Rejections per 1,000 Examinees		
All Causes	380	544	63
	Percentage of Rejections		
Mental Deficiency	21.8	19.6	16.5
Psychosis	.5	.4	.3
Other Psychiatric	24.7	25.2	24.2
Total Mental	47.0	45.2	41.0
Neurological	2.8	3.0	2.9
Eye Defects	3.8	3.0	1.7
Ear, Nose, Sinus, and Throat	4.7	4.2	3.3
Pulmonary TB	2.2	4.0	2.2
Other Respiratory	2.1	3.5	2.6
Hypertension	1.5	1.8	2.6
Cardiovascular	4.8	3.6	4.8
Gastro-intestinal	1.0	.9	1.1
Genito-urinary excluding V.D.	2.3	2.5	2.7
Syphilis	.2	.6	3.6
Hernia	3.0	4.1	2.5
Flatfeet	2.1	1.6	2.3
Other Musculo-skeletal	7.7	6.5	8.3
Other Physical	6.2	7.8	8.9
Total Physical	44.4	47.1	49.5
Administrative	1.3	1.1	4.4
Limited Service	7.3	6.6	5.1
All Causes of Rejection	100.0	100.0	100.0

* Mostly men previously rejected.

The similarity in the three distributions of cause of rejection is noteworthy, especially in view of the widely different rejection rates. It suggests that borderline cases occur with about the same relative frequency for each of the causes of rejection shown.

The relatively high rate of rejection for pulmonary tuberculosis and other respiratory disorders among men previously rejected may result from rechecks of cases with doubtful chest X-ray. The high rate for syphilis among men previously found acceptable is caused by the practice of deferring spinal puncture tests for neurosyphilis until the induction examination. Revision of the standards of acceptability for hernia in November 1943 may account for the relatively high rejection rate for that condition among men previously rejected, since local boards probably were inclined to send up for re-examination men previously rejected for hernia.

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