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# **HEALTH**

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**OFFICE OF THE SURGEON GENERAL**

**HEADQUARTERS, ARMY SERVICE FORCES, WAR DEPARTMENT**



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# DISEASE AND INJURY

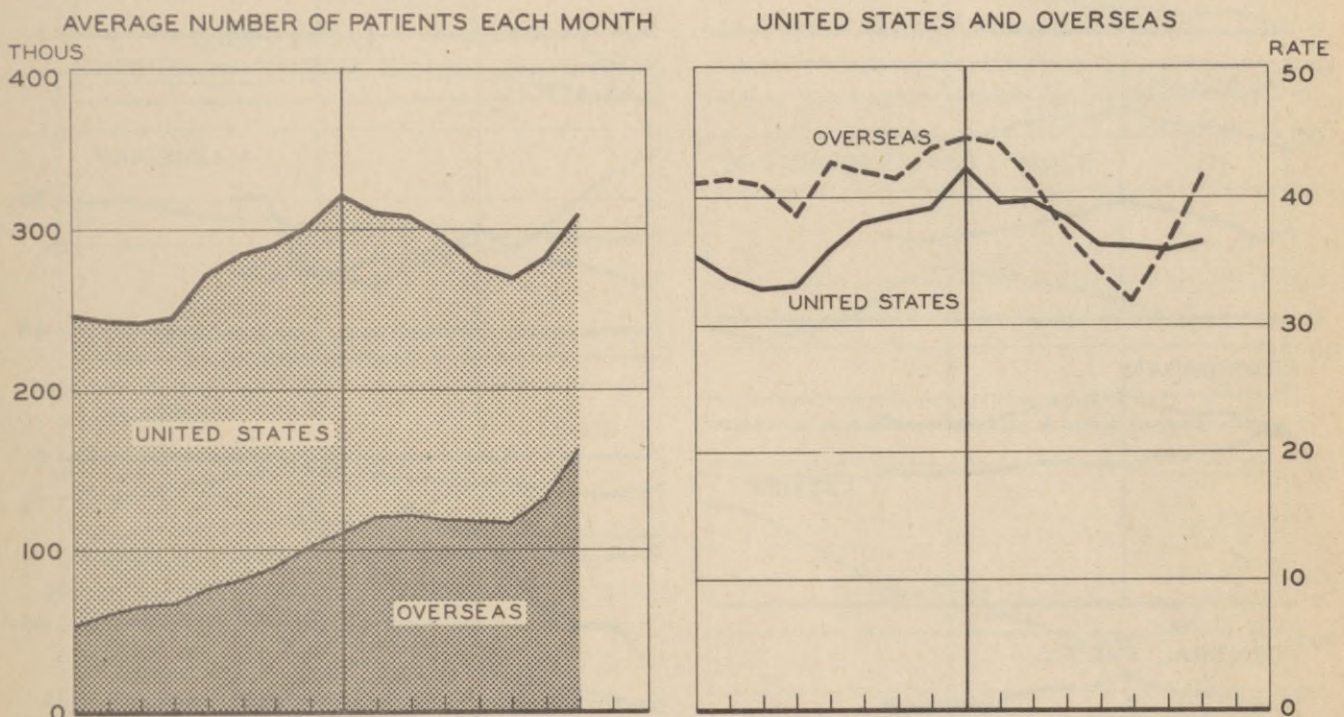
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## NONEFFECTIVE RATES, U. S. AND OVERSEAS

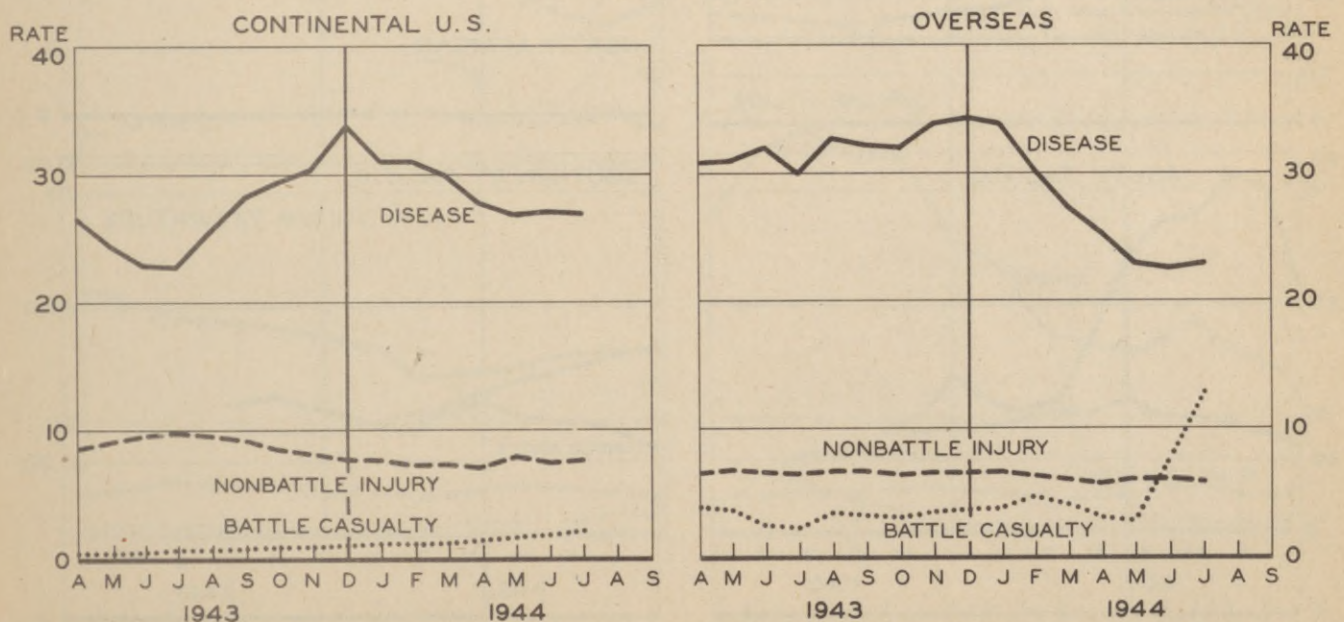
The average noneffective rate in the U. S. changed very little in July, but the overseas rate jumped from about 37 in June to roughly 42 per 1,000 strength in July, close to the peak level maintained at the turn of the year. The change is attributable to the greater number of battle casualties remaining under treatment during July. Correction of the U. S. rate for the influence of evacuees from overseas would lower the rate from 37 to perhaps 30 or less. Correspondingly, the overseas rate of 42 for July would be even higher if evacuees in the U. S. were charged against the overseas strength.

The first panel of the accompanying chart gives the absolute numbers of noneffectives in the U. S. and overseas, computed as an average throughout each month. The other panels are in the form of noneffectives per 1,000 strength.

### AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH ALL CAUSES



### BY MAJOR CAUSE



# DISEASE AND INJURY

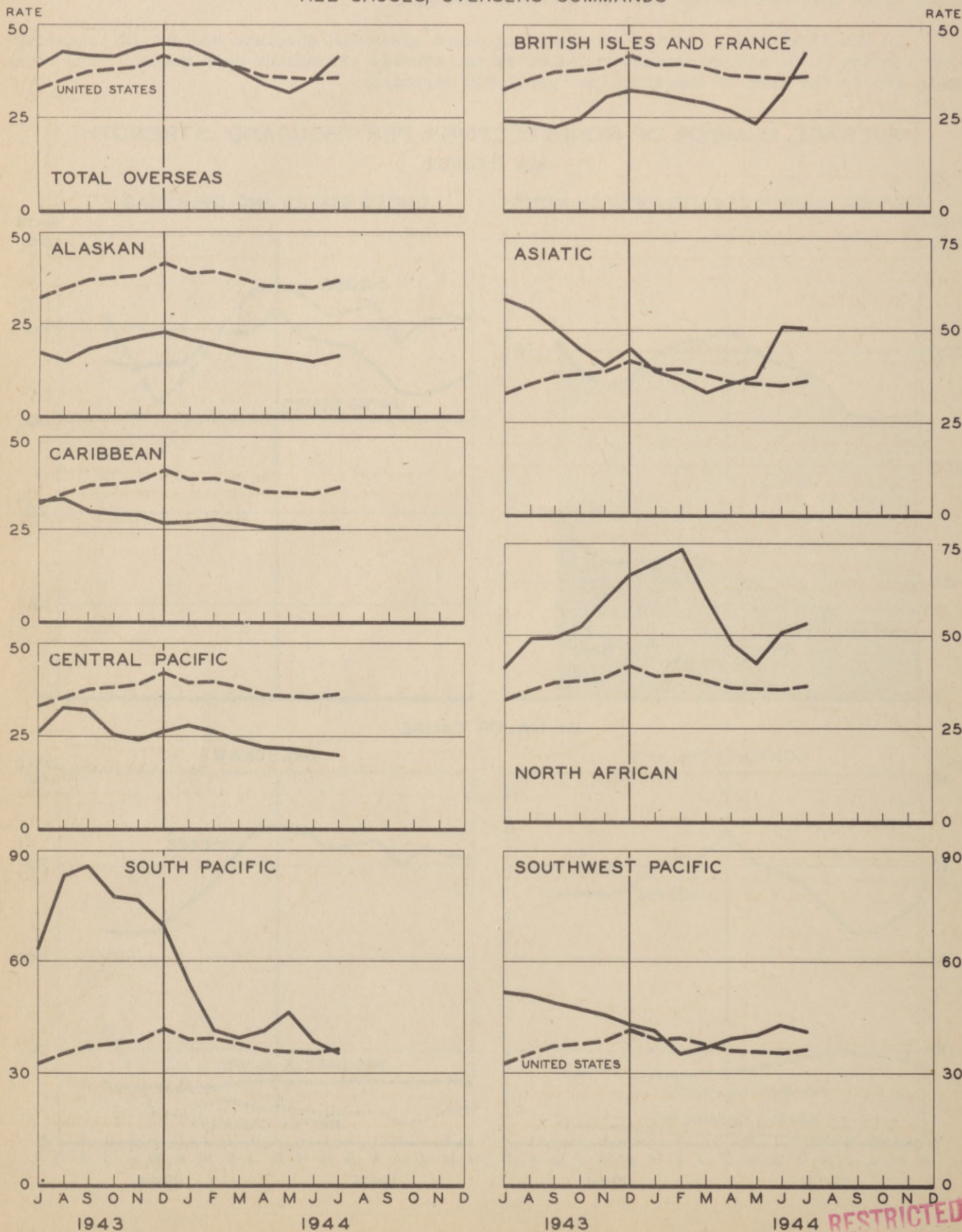
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## TOTAL NONEFFECTIVE RATES, OVERSEAS THEATERS

Only in the British Isles was there a substantial change in the average number of noneffectives per 1,000 strength during June, the rate having advanced by a third or more under the influence of operations in France.

### AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH

ALL CAUSES, OVERSEAS COMMANDS



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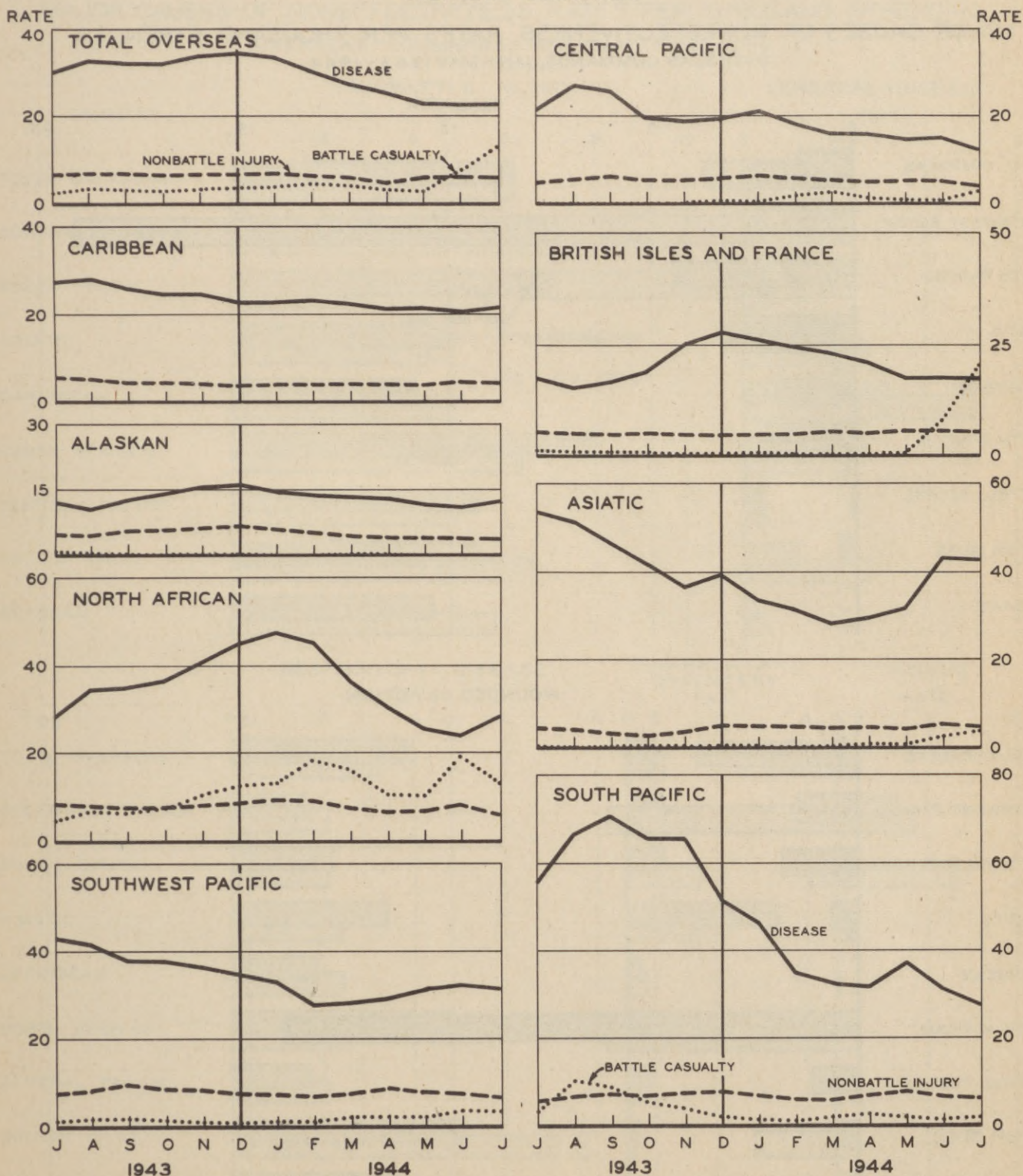
# DISEASE AND INJURY

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## COMPONENTS OF THE NONEFFECTIVE RATES, OVERSEAS THEATERS

The charts give the disease, nonbattle injury, and battle injury components of the total noneffective rates shown on the opposite page. The figures plotted for the British Isles are preliminary estimates prepared in advance of complete telegraphic information. Despite the absence of a backlog of hospitalized battle casualties in the European Theater, its higher casualty rate during July has already resulted in a battle casualty noneffective rate in excess of that for North Africa.

### AVERAGE NUMBER OF NONEFFECTIVES PER THOUSAND STRENGTH OVERSEAS COMMANDS



DISEASE AND INJURY

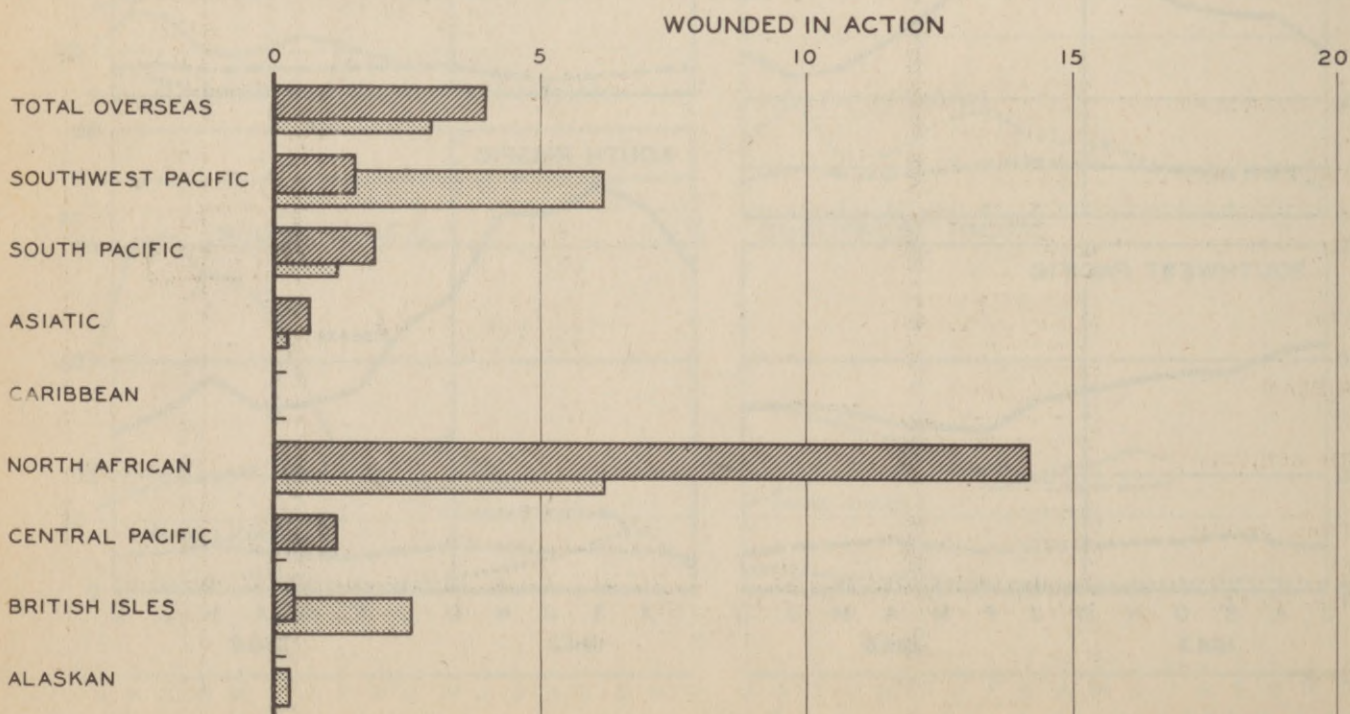
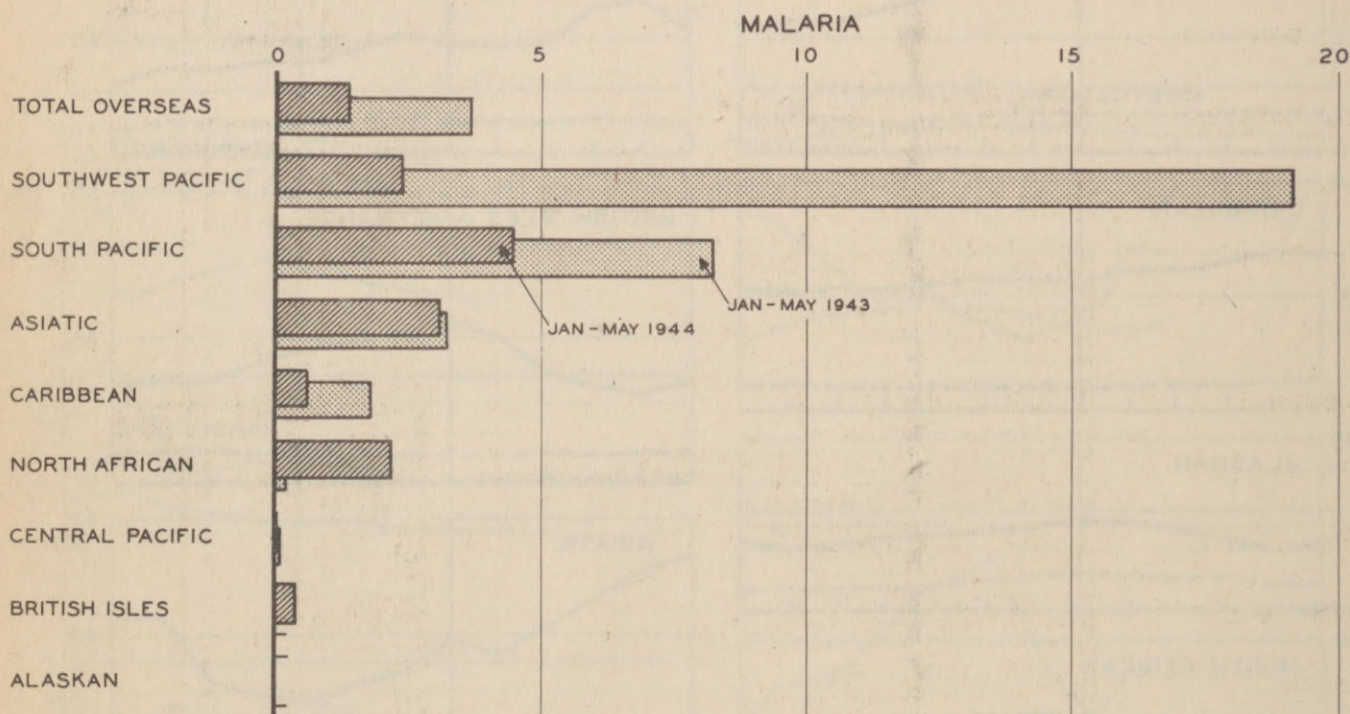
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NONEFFECTIVE RATES, SELECTED DIAGNOSES

In most overseas theaters noneffectiveness from all causes has declined considerably since the beginning of 1943, although increases have been registered by certain diseases and by battle injury. The charts below and on the following page portray the changes which have occurred in noneffectiveness from selected causes since 1943, the first five months of each year being taken for comparison.

The variations in malaria noneffectiveness are discussed more fully on pages 10 and 11. Noneffectiveness attributable to nonbattle injury has been relatively constant in all overseas commands during the last year and a half, although noticeable improvements were made

MAJOR CAUSES OF NONEFFECTIVENESS, RATES PER THOUSAND STRENGTH  
OVERSEAS COMMANDS, JAN - MAY 1943 - 1944



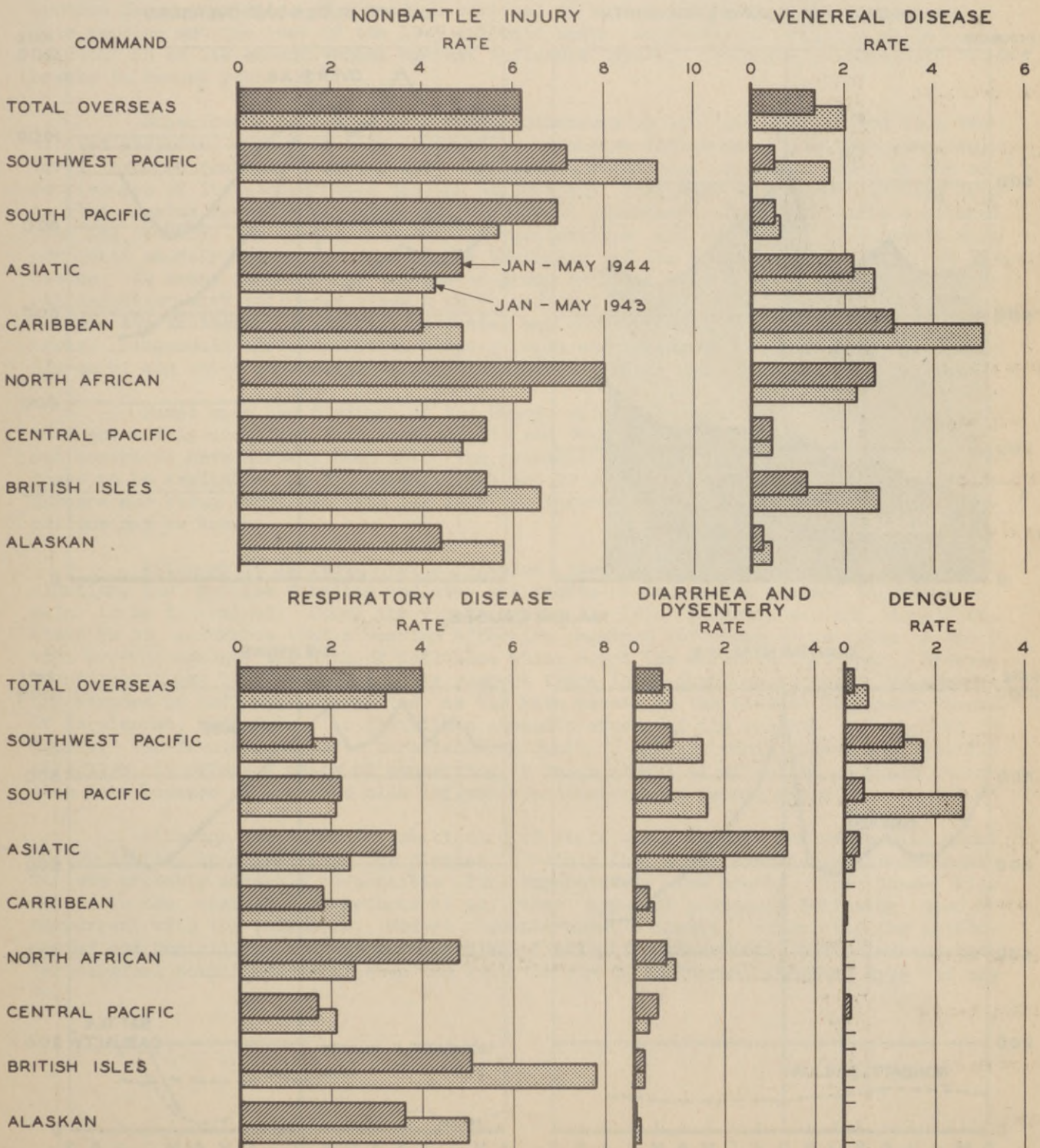
# DISEASE AND INJURY

## Noneffective Rates, Selected Diagnoses (Continued)

in the Southwest Pacific, the British Isles, and the Caribbean. The increase in North Africa is the concomitant of increased tactical activity.

Noneffectiveness from respiratory disease was a major factor in both 1943 and 1944, especially in the northern latitudes. The 1944 rate for North Africa is almost twice that for 1943. The relative importance of diarrhea and dysentery declined in most theaters over the period under scrutiny, but the Asiatic Theater provides an outstanding exception. Dengue caused considerable noneffectiveness in the South and Southwest Pacific during the first five months of 1943, but has been much less a problem during the corresponding period of 1944.

### MAJOR CAUSES OF NONEFFECTIVENESS, RATES PER THOUSAND STRENGTH OVERSEAS COMMANDS, JAN - MAY 1943 - 1944



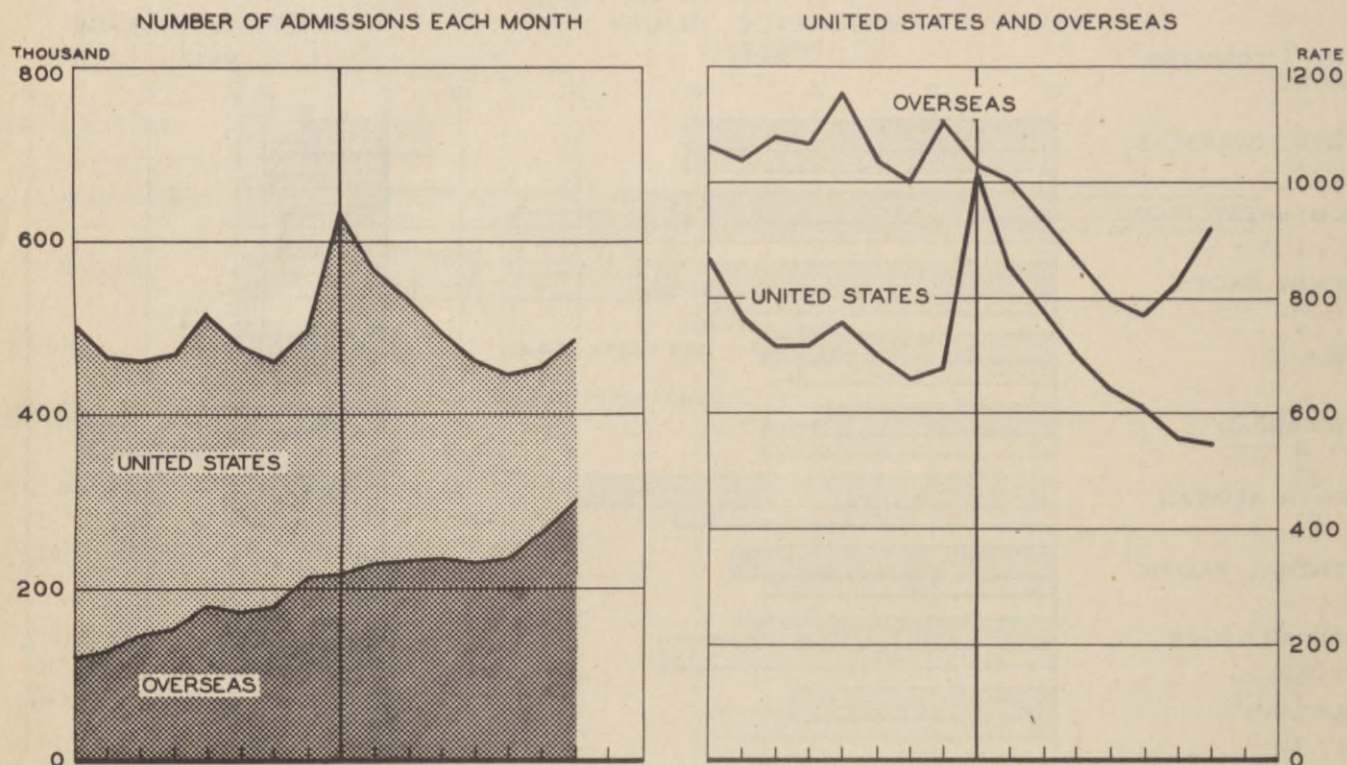
DISEASE AND INJURY

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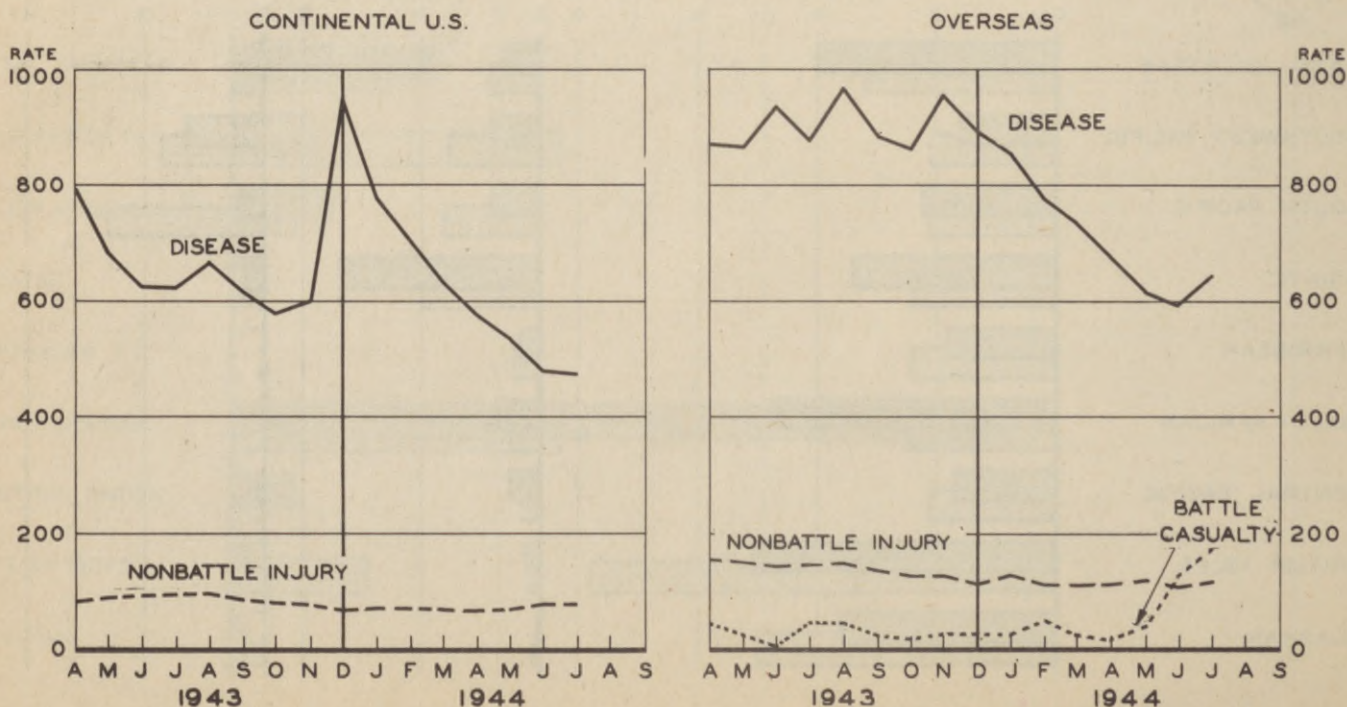
DISEASE, INJURY, AND BATTLE CASUALTY

There have been important changes in the overall picture of admissions for disease, nonbattle injury, and battle casualty. Outstanding among these is the continued decline in admissions for disease both in the U. S. and overseas, although the overseas rate increased during July. A second factor of importance is the fact that, starting with May, there are now more admissions overseas than there are in the U. S., chiefly because of the shift in strength. The first panel gives the absolute numbers in thousands, all the other panels being in rate form. The third factor is the relative importance of battle casualty, there having been more admissions in June and July for battle than for nonbattle injury overseas.

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



MAJOR CAUSES



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## DISEASE AND INJURY

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### VACCINATION AGAINST INFLUENZA

The respiratory diseases are of two characteristic types, bacterial and virus, the latter including the various strains of influenza. The tremendous variation in yearly incidence of respiratory disease, illustrated by the several towering peaks of incidence in the past 12 years (see HEALTH for December 1943), is believed to stem in large part from the variable incidence of influenza, against which prophylactic and therapeutic measures have been relatively ineffective. There is always some danger that an epidemic of considerable size may break with little or no warning. The classical case of the 1918 pandemic, costing upwards of 18,000 deaths and untold noneffectiveness among troops in the U. S. alone, is not readily forgotten. Within the realm of greater likelihood, an experience such as the U. S. epidemic of 1940-1941 could quickly add 10 or 15 points to the noneffective rate, interfere with troop movements, and otherwise hamper military operations. It is a matter of considerable importance, therefore, that the work of the Army Epidemiological Board now makes it possible to produce large quantities of a vaccine composed of killed influenza virus types A and B. This vaccine met the test of the 1943 epidemic under controlled conditions which leave no doubt as to its effectiveness against influenza type A, the cause of influenza outbreaks in recent years.

Experiments conducted with human volunteers in 1941 and 1942 showed that vaccinated subjects were much less susceptible to active influenza virus than were similarly exposed controls. During 1943 the Board arranged for clinical tests of the effectiveness of its concentrated vaccine against any influenza which might develop late in 1943, using as subjects about 12,000 student volunteers in 9 ASTP units scattered over the country. By chance, most of the vaccinations and selections of controls were completed shortly before or just at the beginning of the epidemic of November and December. In every instance the vaccinated group suffered less from the widespread natural infection with influenza virus A which occurred at that time. For the 9 groups as a whole the incidence among the vaccinated was about one-third of that among the controls. Diagnostic differentiation between colds and influenza was made with all possible care, and later immunological studies failed to shake the clinical observations.

Based upon the findings of the Board, which have been both carefully scrutinized and widely acclaimed, influenza vaccine has been made an item of supply for the Army, and contracts have already been let. The schedule of deliveries provides for 3,000,000 doses to be available by 31 December 1944 and 10,000,000 by 31 May 1945. Theater commanders are being furnished with the detailed information on the basis of which requisitions may be drawn.

Although it is known that a relative immunity develops within a week of vaccination, the precise duration and even the degree of protection against influenza remain to be determined. Since the virus causing the 1918 pandemic was not identified, there is no assurance that a vaccine effective against influenza virus types A and B will protect against the kind of influenza which swept the world in that year. However questionable may be its value in this respect there is no doubt as to its value against the viruses of influenza identified as the main causes of the disease in recent years. It is planned, therefore, to distribute adequate stocks of the vaccine and to hold it against the development of a threatened epidemic. Quickly administered and quickly effective, it offers a means of conserving a large amount of effective manpower otherwise lost because of even the mild influenza encountered in recent years.

Although the official statistics of World War I credit influenza with about 25,000 deaths, in actual fact the disease is rarely fatal, and even during the pandemic it was probably directly responsible for comparatively few deaths. The danger lies rather in the chance of streptococcal and other types of pneumonia following upon or concurrent with the influenza. Modern chemotherapeutic agents, especially the sulfonamides and penicillin, offer great promise of effective therapeutic control of the bacteriological complications of even the 1918 variety of influenza, whatever type it may be.

# DISEASE AND INJURY

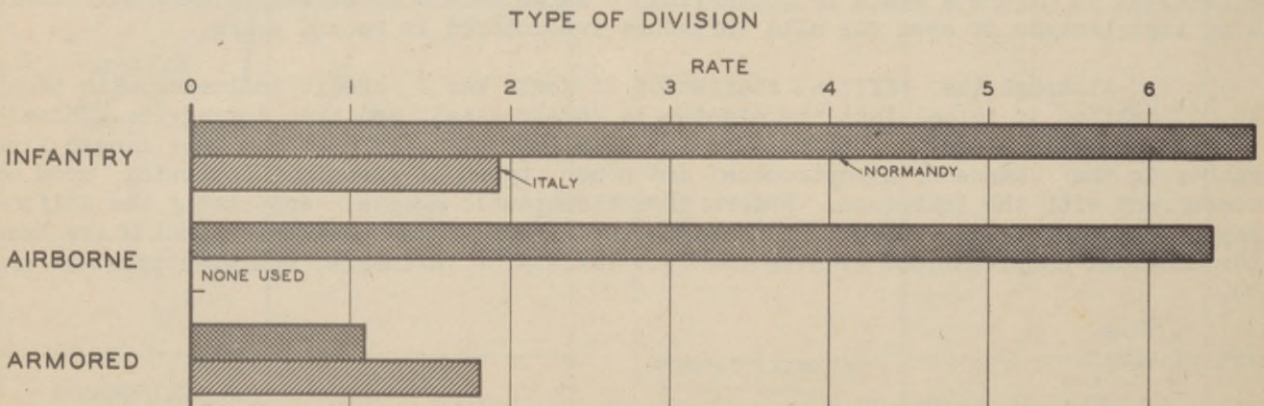
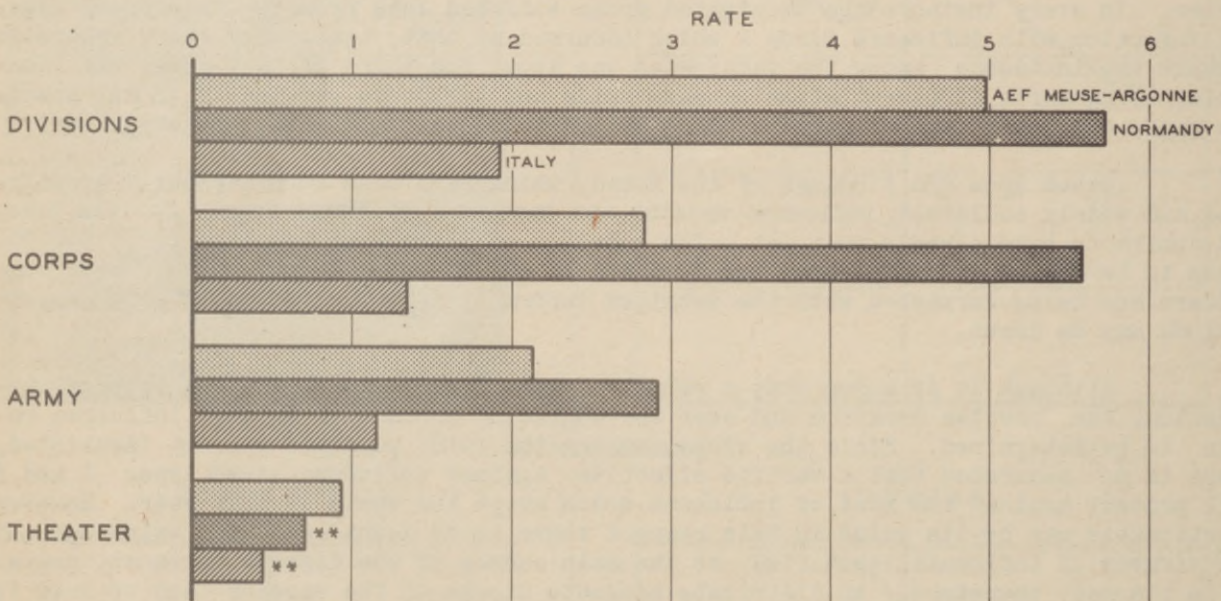
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## CASUALTIES, NORMANDY AND ITALY

During the months of June and July, the American armies fighting in Normandy sustained wounded in action at a rate which is approximately 2.5 times that for the Fifth Army in Italy. The average rate for ground forces in France was 2.9 men wounded per thousand strength per day, and the corresponding rate for the Fifth Army was only 1.2, according to preliminary radio reports. While the figures for large aggregates of troops such as an army or a corps are believed to be quite accurate, those for smaller units may be subject to some correction.

The first panel of the chart below compares the experience in France and Italy with the average rates for units of the American First Army during the Meuse-Argonne Campaign in World War I. As stated there, the World War I data exclude gassed cases. An element of non-comparability exists between the World War I and World War II rates for divisions because the Meuse-Argonne data are based upon the experience of divisions while they were in the line, units being excluded from the rate when they were sent into tactical reserve. Inasmuch as the tactical assignments were not known for the divisions in Normandy and Italy, their experience was included for all weeks during which they were known to be in the combat zone. In effect, therefore, these rates have been diluted to an unknown degree by the inclusion of their experience while divisions may have been in reserve. However, any corrections would have the effect of increasing the rates, so that the divisional rates of about 5.7 wounded per thousand strength per day for Normandy, and 1.9 for Italy, may be regarded as minimum

BATTLE CASUALTIES,\* ADMISSIONS PER THOUSAND MEN PER DAY  
 ITALY, 1 JUNE - 31 JULY; NORMANDY, 6 JUNE - 28 JULY



\* Wounded in Action Only  
 \*\* Including Air Force Casualties

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## CASUALTIES, NORMANDY AND ITALY (Continued)

values from the standpoint of comparison with World War I figures. The differences between the rates for the divisions on the two fronts may be accounted for by differences in the tactical situations. Whereas in Normandy the American forces were engaged in assault on prepared positions in expanding their beachhead, and in maneuvering against strong resistance, the Fifth Army, after the capture of Rome on 4 June, was relatively unopposed in its movement up the Italian peninsula behind the retreating German forces. Data covering the operations over the period commencing with the break-through at Cassino to the end of May are not now available in such form as to permit their inclusion in all of the average rates for North Africa. However, divisional experience for this month is available, and when included with the divisional experience for June and July it yields an average divisional rate of about 2.0, about 5 percent greater than the rate for the last two months. The rate for May alone is about 2.3, or about 20 percent greater. The average theater rate was greater for the AEF in World War I than is the current rate for the European Theater, although the army, corps, and divisional rates were smaller because the proportion of service and overhead personnel was smaller in the first World War.

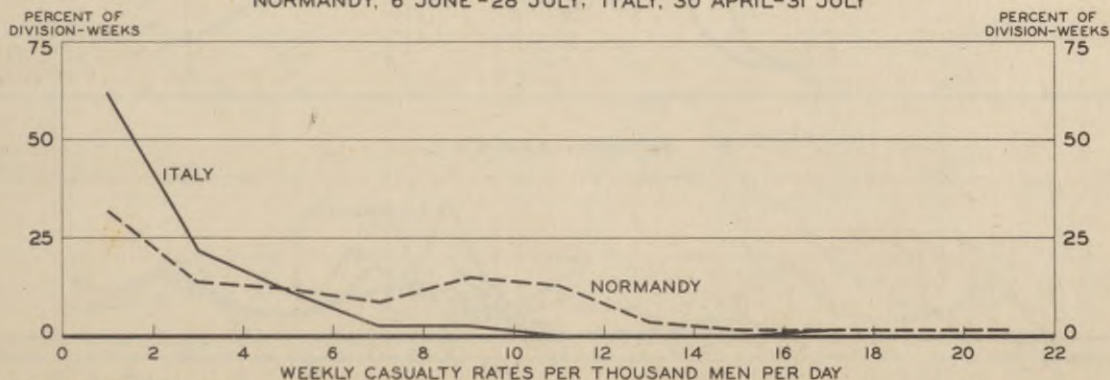
The panel at the bottom of the previous page compares the forces in Normandy and Italy with respect to the casualty rates of three types of divisions. The divisional strengths from which these rates were determined are mean values of theater machine-record counts made at monthly or semi-monthly intervals. Based upon statistics of men wounded in June and July, infantry divisions in Normandy experienced the highest rate, about 6.7 per thousand men per day in comparison with 1.9 in Italy. The rate of 6.4 for airborne divisions in Normandy has no counterpart in the Italian experience. However, for armored divisions the rates are 1.8 and 1.1 for troops in Italy and France respectively. The highest rate for any single division-week was that for the 101st Airborne Infantry, about 21 per thousand per day for the first week after D-day. This rate is attributable to casualties sustained in the first 2 or 3 days of the invasion. Rates based upon the daily experience of this division would probably exceed that of the 27th division during the last war. This division lost men (wounded) at the rate of 65 per thousand men per day on 29 September 1918 when it participated in a frontal assault on the German "Hindenburg" line. Other high rates for divisions in Normandy were 19 for the 30th Infantry for the week ending 14 July, 17 for the 9th Infantry for the week ending 21 July, and 15 for the 83rd Infantry for the week ending 7 July. During the time-period under consideration the highest divisional casualty rate for wounded in North Africa was that of 6.9 per thousand men per day for the 34th Infantry Division during the week ending 14 June.

The distributions in the chart below compare the range and frequency of weekly divisional casualty rates in France and Italy, regardless of their tactical assignment. In order to make the distributions most directly comparable on a campaign basis, the experience of units in Italy during May, excluded from most of the foregoing analysis, were added.

The most significant difference between the distributions is in the proportion of weeks when the divisional casualty rates were less than 2.0 per thousand per day, being 32 percent for units in Normandy and 62 percent for divisions in Italy. In addition, 50 percent of the division-weeks for the forces in Normandy had rates under 4.8 per thousand men per day whereas 50 percent of the division-weeks in Italy had rates under 1.6 per thousand men per day. Ten percent of all division-weeks had casualty rates greater than 5.2 in Italy while 10 percent of the rates for the units in Normandy were greater than 11.6.

## DISTRIBUTIONS OF WEEKLY DIVISIONAL CASUALTY\* RATES

NORMANDY, 6 JUNE - 28 JULY; ITALY, 30 APRIL - 31 JULY



\* Wounded in action only.

# DISEASE AND INJURY

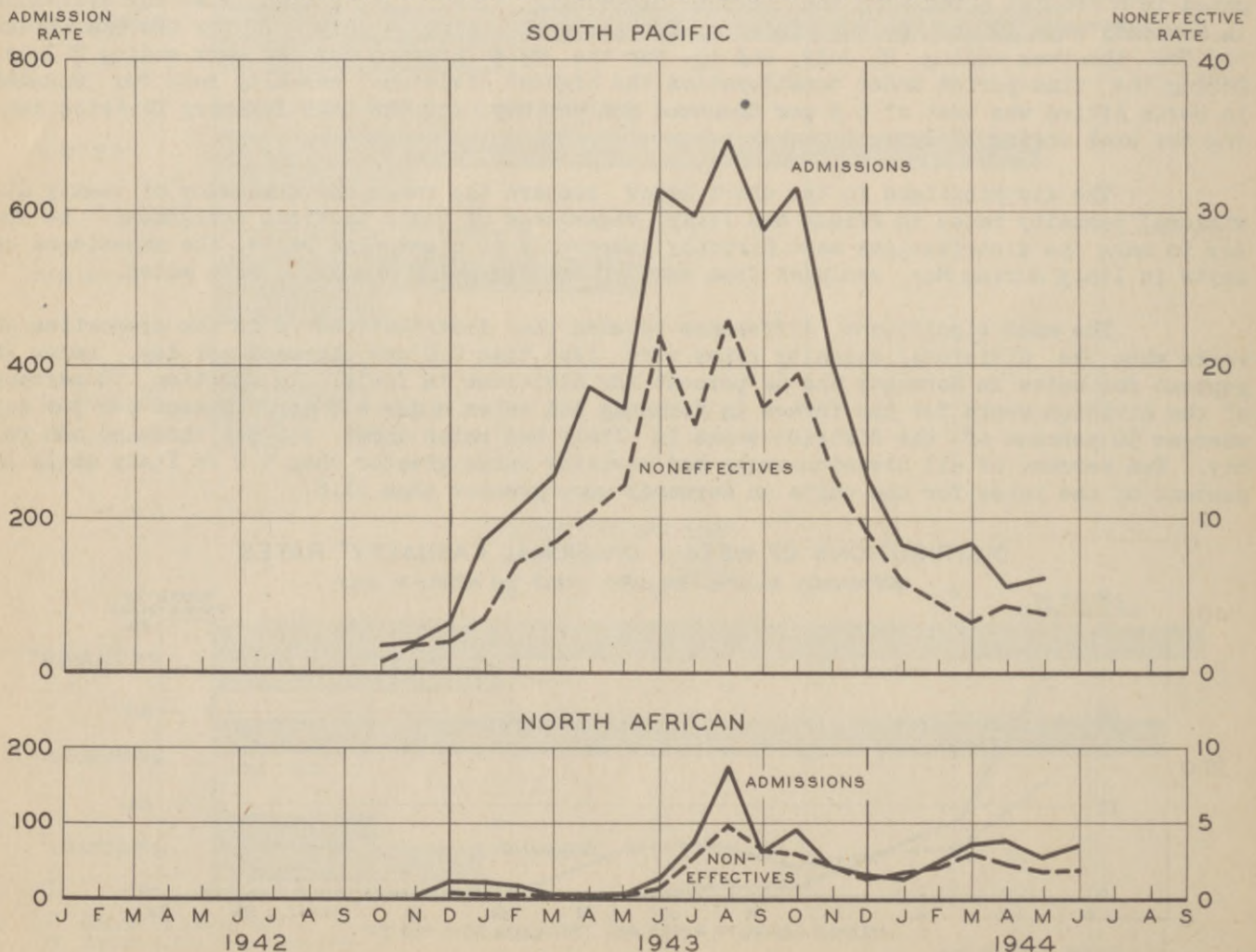
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## MALARIA

The charts below and on the following page summarize the incidence of malaria in the South and Southwest Pacific, and in the Asiatic and North African theaters through May 1944, the latest month for which data are available. In addition, the dotted line in each panel represents the noneffective rate attributable to malaria. It will be recalled that the noneffective rate for any cause represents the combined effect of the admission rate and the average amount of time lost per admission. The rates include diagnosed malaria only. In the Southwest Pacific especially this tends to underestimate the importance of malaria because primary attacks of malaria diagnosed as fever of unknown origin are thus excluded.

The pattern of incidence is more closely related to the seasonal prevalence of the malaria vector in the Asiatic and North African theaters than in the other commands. However, the rapid fall in the Asiatic rates toward the end of 1943 is partly attributable to increases in the strength of the theater, for the new arrivals did not contribute proportionally to the admission rate. The rise in the rate for North Africa during the early months of 1944 was caused by increased numbers of relapses, since mosquito transmission does not occur there during this season. The variations in seasonal transmission in the South and Southwest Pacific have been completely obscured by the incidence of relapsing malaria, admissions for which have maintained the incidence and noneffectiveness at higher levels than would result from primary cases alone. The peak incidence in the SWPA was recorded in February 1943, during the Buna-Gona campaign, when the admission rate for the entire theater reached 400 per thousand men per year. During this month noneffectiveness from malaria also reached its peak value, the rate of 22 noneffectives per thousand strength representing more than a quarter of the noneffectiveness from all causes. In the South Pacific area, the peak rate of 695 admissions per thousand men per year was reached in August 1943, and does not represent a peak in transmission, as in the Southwest Pacific, but rather a consequence of attempts to de-

MALARIA, ADMISSIONS PER THOUSAND MEN PER YEAR, AND AVERAGE NONEFFECTIVES PER THOUSAND STRENGTH



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DISEASE AND INJURY

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MALARIA (Continued)

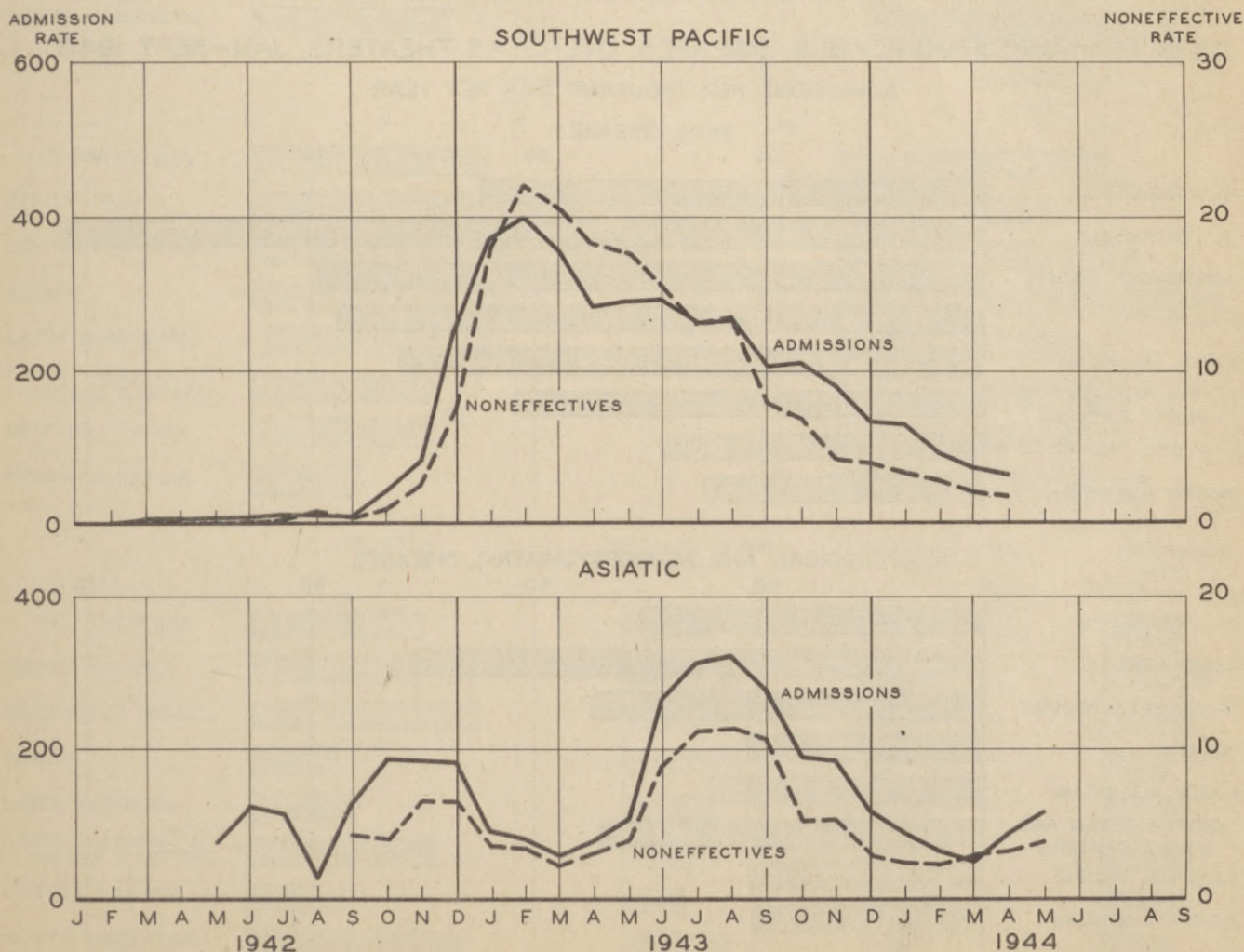
malariaize the Americal and 25th Infantry Divisions exposed on Guadalcanal during the early phases of combat in the Solomons. During August the Americal Division had 3,800 admissions per thousand men per year, all of which represented relapses or delayed primary attacks. The experience of the Americal Division and other combat divisions has been discussed in HEALTH for December 1943, and for May 1944.

The following table compares the average malaria rates with those for all causes, including battle casualties, during 1943:

Theater	Admission Rates			Noneffective Rates		
	All Causes	Malaria		All Causes	Malaria	
		Rate	Percent of Total		Rate	Percent of Total
Southwest Pacific	1,224	244	20	53	11	21
South Pacific	1,832	427	23	66	14	21
Asiatic	1,079	181	17	39	6	15
North African	1,163	54	5	52	2	4

The continued decrease in the malaria rates for the South and Southwest Pacific theaters is the measure of heightened and more effective mosquito control and of more vigorous atabrine discipline. The decline in noneffectiveness measures not only the decrease in primary incidence but also the suppression of subsequent attacks by continued use of atabrine.

MALARIA, ADMISSIONS PER THOUSAND MEN PER YEAR, AND AVERAGE NONEFFECTIVES PER THOUSAND STRENGTH



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DISEASE AND INJURY

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NONCOMMUNICABLE DISEASES OVERSEAS

Approximately 40 percent of all disease admissions to hospital and quarters overseas are for the noncommunicable diseases. The charts below and on the following page provide preliminary admission rates for the first nine months of 1943 for the more prevalent of the noncommunicable diseases in all the overseas commands except the British Isles. Diseases of similar etiology are grouped together except where particular diseases are of sufficient interest to be considered separately. The diseases listed comprise approximately half of all admissions for noncommunicable disease during the nine-month period. The rates are preliminary in that they have been adjusted to compensate for the exclusion of admissions remaining under treatment at the end of 1943, and are ranked by theater according to the incidence of skin diseases. The same scale has been used on all panels except those for skin and for neuropsychiatric diseases (organic neurological plus neuropsychiatric disorders).

The first panel below gives the admission rates for skin diseases attributable to various forms of infection, including those caused by plant and animal parasites, and to disorders of metabolism, growth, or nutrition. However, the rate does exclude scabies which is usually classified with the infectious diseases. Skin diseases as a group were the leading cause of admission for noncommunicable diseases, the rate for troops overseas (excluding the British Isles) being about 68 admissions per thousand men per year for the nine-month period.

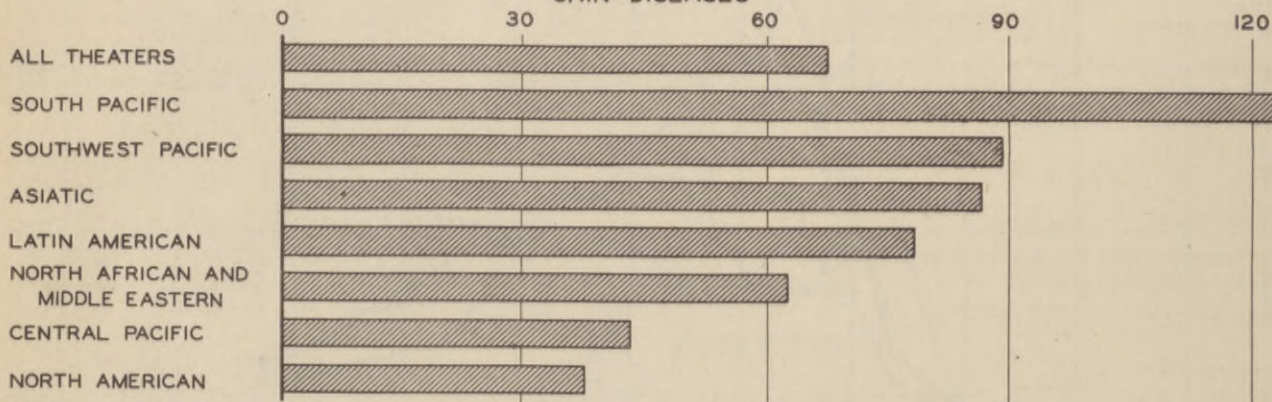
The rates for neurological and psychiatric disease were compared with admission rates for wounded in action to see what relationship there might be at the gross level of theater rates. The results are merely suggestive, and it is evident that many other factors must be considered in making comparisons among theaters. For all theaters studied, the average rate was 46 admissions per 1,000 men per year. The rate of 77 for the South Pacific was by far the highest of all the theater rates.

Inasmuch as the conditions of climate, geography, and exposure which predispose troops to a greater incidence of skin disease in one theater rather than another also influence the incidence of allergies and sensitivity reactions, the relative rank of the var-

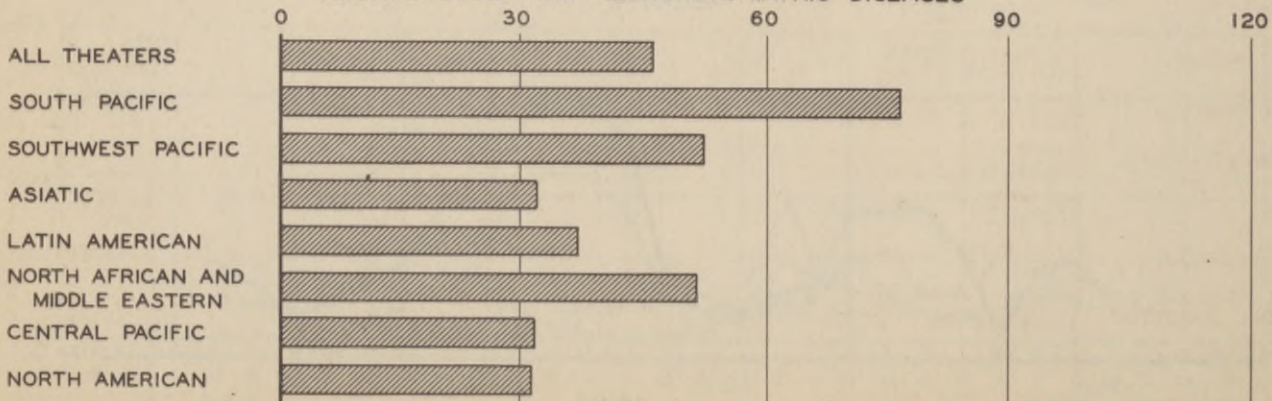
SELECTED NONCOMMUNICABLE DISEASES, OVERSEAS THEATERS, JAN-SEPT 1943

ADMISSIONS PER THOUSAND MEN PER YEAR

SKIN DISEASES



NEUROLOGICAL AND NEUROPSYCHIATRIC DISEASES



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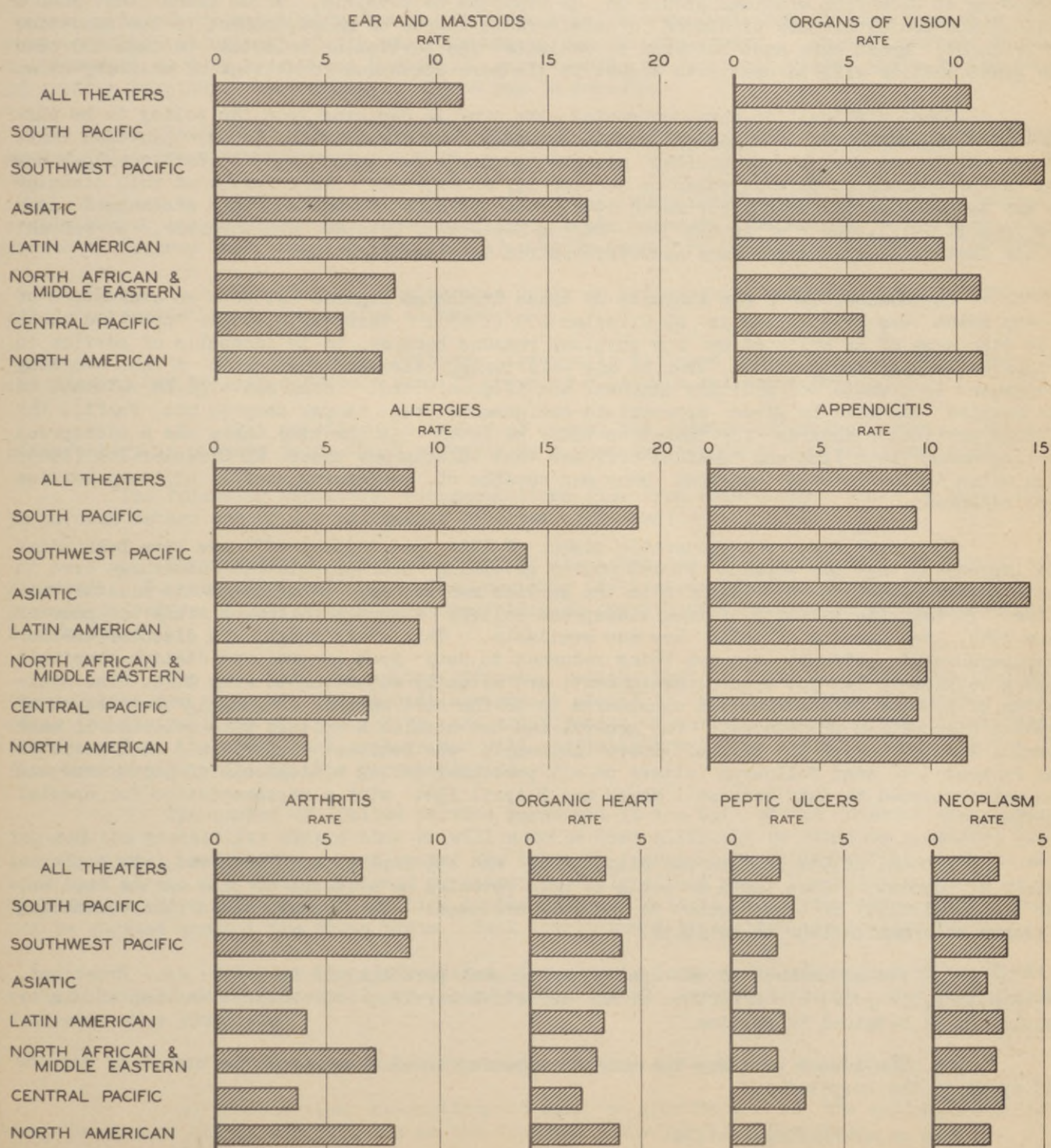
# DISEASE AND INJURY

## NONCOMMUNICABLE DISEASES OVERSEAS (Continued)

ious theaters on skin diseases is maintained for these two groups also. The allergies include reactions to immunization, to anaesthesia, to the sulfa drugs, and to malaria prophylaxis, as well as bronchial asthma and hayfever, food allergies, and the sensitivity reactions of the skin to plant poisons.

The initial selection of men in the lower age brackets for military service, together with further screening preparatory to overseas service, inevitably results in low rates for the neoplastic diseases, organic heart disease, and arthritis, disturbances associated with aging. For the Army overseas, the annual rates for neoplasm, organic heart disease, and arthritis were respectively 3, 3, and 7 admissions per thousand strength.

### SELECTED NONCOMMUNICABLE DISEASES, OVERSEAS THEATERS, JAN-SEPT 1943 ADMISSIONS PER THOUSAND MEN PER YEAR



## DISEASE AND INJURY

**CONFIDENTIAL**THE LIMITED ASSIGNMENT OF PSYCHONEUROTICS

Since the beginning of the War the Army has been confronted with a serious problem with respect to the criteria to be applied in accepting or rejecting inductees for neuropsychiatric reasons, and in retaining or discharging from the service personnel incapacitated by neuropsychiatric conditions. It is of the utmost importance that the criteria be such as to prevent both unwarranted exemptions from military service and indiscriminate discharge once a man has been accepted for service. Nothing could destroy public faith in the integrity of the Selective Service System, and probably no single step could more adversely affect the morale of the Army, than uncontrolled rejections or discharges for neuropsychiatric reasons.

The psychiatrist would have relatively little difficulty in reaching conclusions about discharges if only the patient were involved, but clearly every judgment about an individual inductee or soldier has considerable significance for a larger group. Because of the inherent difficulties, there has been considerable variation in policy regarding the acceptance and retention of psychoneurotics in the service. It is generally agreed that screening at induction stations should be as rigorous as possible, which means that when a medical and social history discloses a considerable degree of maladjustment to the peacetime environment, great care must be taken to evaluate the particular selectee because the odds are great that he will be unable to adjust to the more strenuous conditions of military life.

Great difficulties have confronted the Army in deciding upon the policy to be pursued in discharging men for psychoneurotic reasons. WD Circular 161 (1943) provided that: "Those who do not meet the prescribed minimum standards for induction will be discharged under the provisions of this circular or Section II, AR 615-360." As a result of this circular it has been estimated (HEALTH for March 1944) that perhaps 100,000 men were discharged under Sections II, VIII, and X of AR 615-360. During September, October, and November, 37 percent of the Section II discharges were neuropsychiatric in classification.

In November 1943, the enormity of these discharge figures led to a re-evaluation of policy which was crystalized in WD Circular 293 (1943). This new circular provided that: "The discharge of an enlisted man for physical reasons because he is incapable of service in a physically exacting position when he may well render adequate service in a less exacting assignment is a waste of military manpower and is prohibited. Such men will be retained in the service and will be given appropriate assignments even though they do not fulfill the minimum physical standards for induction under MR-1-9." At the time there was a widespread feeling among both line and medical officers that discharges under WD Circular 161 (1943) were often indiscriminate and that many men capable of performing useful military service were released.

More recently, a considerable number of line and medical officers have been under the impression that the present strict policy governing neuropsychiatric discharge errs in the opposite direction by retaining in the service men who are a burden to the military machine. To test the validity of this widespread belief, a sample follow-up study was made in June 1944, the results of which are now available. This study sought to discover whether neuropsychiatric patients who are being returned to duty from general and station hospitals with a recommendation for special assignment, are actually adjusting to Army life. The evaluation of company commanders was considered to be the best method of judging the success of present disposition procedures. One general and two station hospitals were selected in each service command except the Eighth, where the sample was somewhat larger, and each hospital was requested to send follow-up letters on all personnel having a diagnosis of psychoneurosis who were returned to duty between 1 March and 1 April 1944 with a recommendation for special assignment.

A total of 938 letters was dispatched, and 439 replies were received, or approximately 47 percent. Such tests as could be made revealed no evidence of bias in the replies, but the possibility of bias cannot be entirely excluded. The letters asked the commanding officers of organizations to estimate:

1. The adjustment of the special assignment personnel in terms of: a. Excellent, satisfactory, or poor; b. Effective or non-effective service; c. Whether the man should or should not be retained in service.
2. The number of times the man had appeared on sick call and the number of days he had spent in the hospital.

The major findings follow:

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## DISEASE AND INJURY

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THE LIMITED ASSIGNMENT OF PSYCHONEUROTICS (Continued)

1. In 26 percent of the cases, the adjustment was considered excellent. About 42 percent were rated satisfactory, and the remaining 32 percent were rated poor.

2. For the most part, men who received ratings of excellent or satisfactory should, in the opinion of their commanding officers, be retained in the service. In 30 percent of all the cases, commanding officers believed that discharge from the service was indicated; in 1 percent, the commanding officers were uncertain. Since the survey covered the two months following reassignment (in many cases the men had only recently joined their organizations), it is noteworthy that commanding officers believed that as many as 30 percent should be discharged. If the opinions of commanding officers are a reliable index, this estimate probably understates the total number who will prove a burden to the Army, since other men will undoubtedly experience difficulties in time. It is recognized, of course, that in certain cases the adjustment will improve with time.

3. There was a significant difference between general and station hospitals with respect to the adjustment of the men returned to special assignment. Only 21 percent of the men returned to duty by general hospitals were considered poorly adjusted, while in the case of station hospitals the comparable figure was 38 percent.

4. The effectiveness of the program of special assignment was definitely hindered by the following circumstances:

a. Although these men were returned to duty for special assignment, a considerable number had APO addresses which usually indicate overseas assignments. There is every reason to believe that many of them will eventually return to the United States as patients.

b. There was a considerable delay in reassigning many men, which doubtless militated against their successful adjustment.

c. The commanding officers frequently violated the spirit of the program by reassigning men to very difficult work in order to eliminate malingering.

d. In a considerable number of cases, the commanding officer noted: "Man unsatisfactory in present job. Could probably do a good day's work if correctly assigned."

The following tentative recommendations flow from this study, which is based on a 50 percent return out of a total sample of about 1,000 men:

1. The results of the survey support the soundness of the principle of special assignment. To the extent that vacancies continue to exist in the Zone of the Interior, the present procedure of giving many psychoneurotics an opportunity for special assignment should be continued.

2. The fact that commanding officers believe that at least 30 percent of the psychoneurotics now returned for special assignment should be separated from the service indicates the desirability of considering the modification of current War Department directives. Allowance for the additional numbers who will probably break down after a longer period of time merely adds point to this recommendation.

3. The number of limited service personnel in the Zone of the Interior is increasing and the probability exists that it will soon be very difficult to continue a general policy of special assignments unless steps are taken to increase the ability of the Army to absorb such as are not easily assigned or cannot be fully effective. One solution would be to introduce a third category in addition to the duty and patient classifications, which would not be counted against the troop basis. Such action would accomplish the following:

a. Obviate the difficulties inherent in large-scale discharges of psychoneurotics, many of whom are capable of contributing useful service although they cannot meet desirable Army standards;

b. Avoid having these represent a charge against the troop basis; and

c. Enable them to continue to make a contribution to the war effort in the Army or in such allied war agencies as the Veterans Administration hospitals.

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# DISEASE AND INJURY

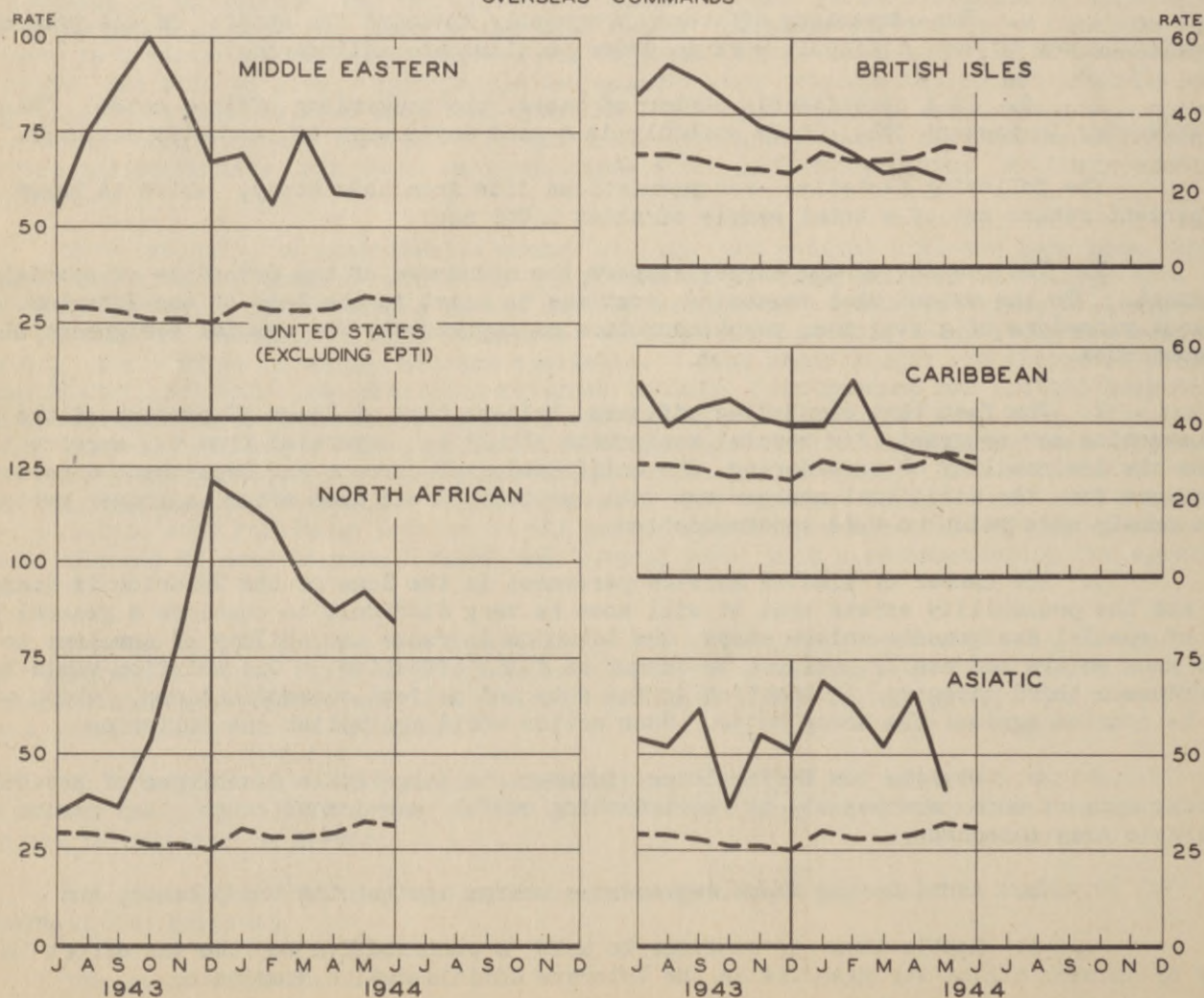
## VENEREAL DISEASE, OVERSEAS THEATERS

Under the influence of the abnormally high incidence of venereal infection in North Africa concomitant with invasion of the Italian peninsula, the venereal disease rate overseas reached a peak of 50 per 1,000 strength per year during December, 1943. Chiefly because of improvement in the North African situation and, to a lesser extent, in the Southwest Pacific, the British Isles, and the Caribbean, the overseas rate has since slowly declined to about 35 per 1,000 men per year for May. The recent strength increases in overseas theaters are such as to produce some general lowering of the total rate, for North Africa, with its high rate, now has a smaller proportion of the total overseas strength than it had previously, and the European Theater, with its lower rate, has a larger proportion than before.

The difficulties of control encountered on the Italian peninsula were discussed at length in HEALTH for March 1944. Since that time there has been some improvement in the prevention of venereal disease, presumably the fruit of the concerted attack which the theater has directed toward this major problem. Since April, however, the rate has been relatively constant at about 85 to 90 admissions per 1,000 men per year, which suggests that further improvement under the present program may prove difficult.

In the Middle East and Persian Gulf Command, which are combined in the accompanying charts, venereal disease admission rates have been consistently higher than average rates for all troops overseas, but the small strength of the area permits wide fluctuation. By reason of both their strength and incidence of infection, the troops of the Persian Gulf Command present the main problem. The mission of this command, involving the maintenance of extensive transportation routes, has made for policing difficulties and has hindered the realization of completely satisfactory discipline.

VENEREAL DISEASE, ADMISSIONS PER THOUSAND MEN PER YEAR  
OVERSEAS COMMANDS



# DISEASE AND INJURY

## VENEREAL DISEASE, OVERSEAS THEATERS (Continued)

The Caribbean area continues to make progress in the control of venereal disease, the rise in February representing an exception to an otherwise general downward trend. The most striking results have been obtained in the Panama Canal Department where the incidence is now roughly comparable to that in the U. S. Native troops in the Puerto Rican Sector still have a high rate of infection, reflecting the high degree of infection among the civilian population. Control measures have been somewhat impeded by native superstitions about the necessity for sexual contact in maintaining good health and about the effect of prophylactics upon potency, but the program is gaining ground.

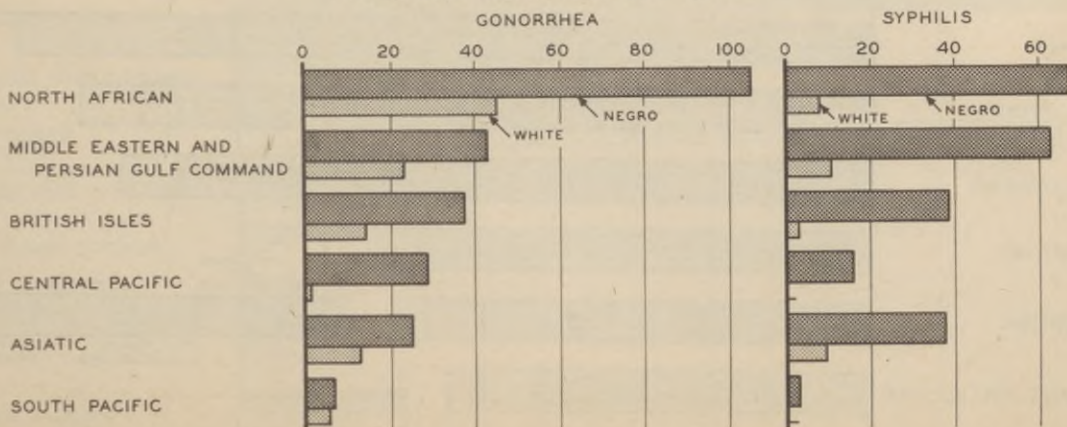
In the Southwest Pacific the average admission rates declined further throughout the early months of 1944. In this theater the problem is confined to certain parts of the Australian mainland, especially Sydney. It has been estimated that perhaps half of all the new cases are contracted in the Sydney area by men on leave or furlough. Newly provided leave ships for the transportation of soldiers to and from advanced bases have presented an excellent means of implementing the control program. Vigorous prosecution of control measures doubtless explains in large part why the rate of infection remains so low.

The brothels of Calcutta, Bombay, and Karachi provide the major sources of infection for troops in the Asiatic theater. The strength of the command is widely scattered and recreational facilities are said to be inadequate, but both the Red Cross and Special Services have obtained additional equipment with which to intensify their entertainment and recreational programs at isolated stations. Special efforts are being made to encourage the use of prophylactics, and medical opinion in the theater appears to favor making prophylactics an item of free issue. Excessive alcoholism has also been singled out for attack by means of education and enforcement of superior discipline.

The progressively favorable downward trend of venereal disease incidence in the British Isles has continued through May, when a rate of 23 was reported, lower than that for the U. S. Epidemiological analysis of the problem in the British Isles has evidently aided in the formulation of a realistic and effective control program. Prophylactic materials are items of free issue, for example. Army nurses have proved highly valuable in locating infected contacts and in placing them under treatment, and their example is said to have stimulated civilian health authorities to institute or expand programs for finding sources of infection. However, the situation in France is potentially dangerous, comparable in many ways with that encountered in Italy. Preliminary reports on the initial experience in Normandy indicate that all towns are off limits to troops and that very little infection was acquired in the early weeks. Special efforts have been made to forestall the development of the analogue of the Italian experience, and the situation will be watched with interest.

Recent changes in reporting make it possible to show venereal disease rates by color for overseas theaters. The reported data for May are summarized in the charts below, which separate gonorrhea and syphilis. No color breakdown is yet available for the Southwest Pacific. Latin America is a special problem from the standpoint of color classification and is also omitted from the comparison. The other venereal diseases, notably chancroid, are not included in the charts. Chancroid is especially prevalent among U. S. troops in North Africa, the Middle East, and the Asiatic Theater.

GONORRHEA AND SYPHILIS, ADMISSIONS PER 1000 MEN PER YEAR  
OVERSEAS COMMANDS MAY 1944



# DISEASE AND INJURY

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## CONTROL OF NONBATTLE INJURIES IN THE SOUTHWEST PACIFIC

Because of the importance of nonbattle injury as a source of noneffectiveness, there has long been evident a need for an adequate and effective control program both in the Continental U. S. and overseas. During 1943 nonbattle injuries overseas caused a loss of almost four million man-days and battle injuries a loss of perhaps half this amount. The loss of time from nonbattle injury is in large part preventable by means of a suitable control program.

A preliminary survey in the Southwest Pacific has revealed that the noneffective rate from nonbattle injury exceeds that from any other disability, being more than double that from neuropsychiatric diseases, the next most common cause. During the year 1943, there were 751 nonbattle injury patients evacuated to the United States in comparison with 551 battle casualties. The experience of other theaters is somewhat analogous, for the problem is common to all.

In order to explore the causes of nonbattle injury, the theater made a study of 16,486 completed cases tabulated from April admissions. Of this group 2,676 or 16 percent were admitted for nonbattle injuries. Classification by type of injury shows that wounds, strains, and sprains make up 65 percent of the injuries, as shown below. Analysis of these data for the numerically more important branches within the theater reveals that for ground

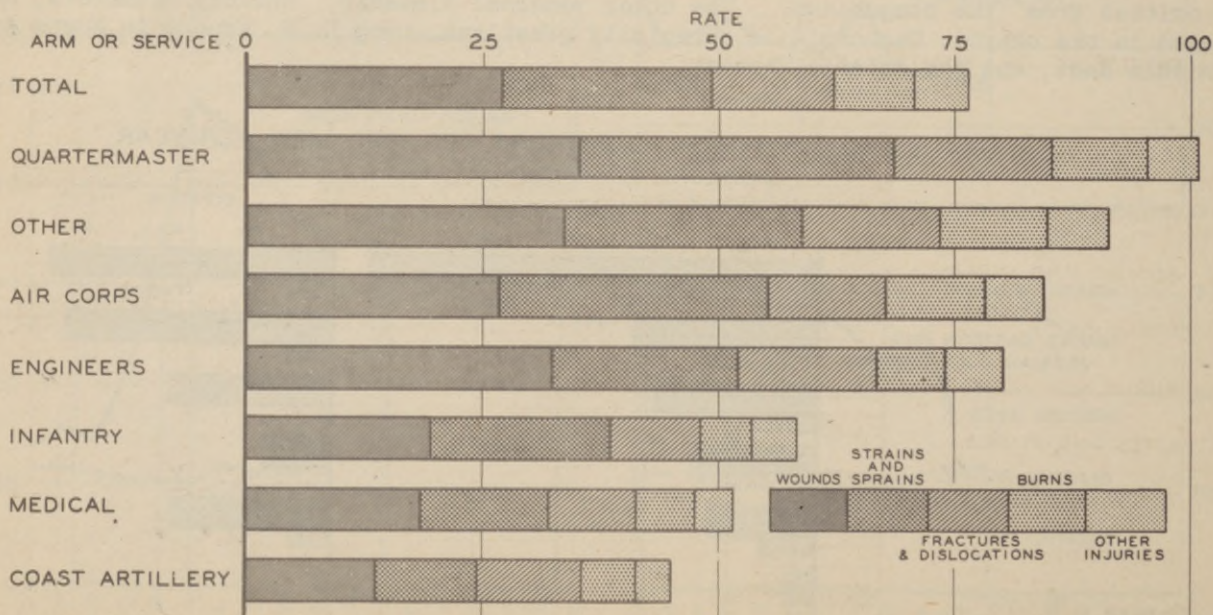
NONBATTLE INJURIES BY TYPE, SWPA, APRIL 1944

	Percent
Wounds (Lacerations, Abrasions, Contusions, etc.)	36
Strains and Sprains	29
Fractures and Dislocations	17
Burns	11
All Other Injuries	7
Total	100

troops the highest injury rates occur in those branches which ordinarily handle heavy equipment and supplies rather than among combat troops. The rates shown in the chart are probably not representative for the Air Corps, since there were few air accidents during the month of April.

A tabulation of all the available records on individual nonbattle injuries occurring in the Southwest Pacific during 1943 confirms the picture revealed by the April data as to type of injury. The chart on the following page depicts the percentage of cases and of

NONBATTLE INJURY, ADMISSIONS PER THOUSAND MEN PER YEAR  
BY TYPE OF INJURY  
SOUTHWEST PACIFIC, APRIL, 1944



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# DISEASE AND INJURY

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## CONTROL OF NONBATTLE INJURIES IN THE SOUTHWEST PACIFIC (Continued)

days lost from each type of injury. Fractures, which require a long convalescent period, account for 38 percent of the days lost. Although dislocations, embracing a relatively small segment of admissions, represent only 5 percent of the total days lost, the average case lost 32 days. This is exceeded only by the average of 37 for fractures. Although wounds comprise the largest group of admissions the average case lost only 9 days.

At an Australian mainland base a survey was made of nonbattle injury patients admitted to general hospitals during a three months period. Sixty percent of the days lost were attributable to traffic accidents, in six percent of which alcohol was a contributing factor. Twenty-seven percent of the days lost were allocated to burns, and 13 percent to personal assaults and injuries. In 49 percent of the latter group alcohol was a contributing factor. At the same base 70 percent of the nonbattle injuries admitted to station hospitals were caused by miscellaneous minor injuries incurred in alighting from moving trams, tripping and stumbling over various objects, jumping from high vehicles, etc., primarily the result of individual carelessness.

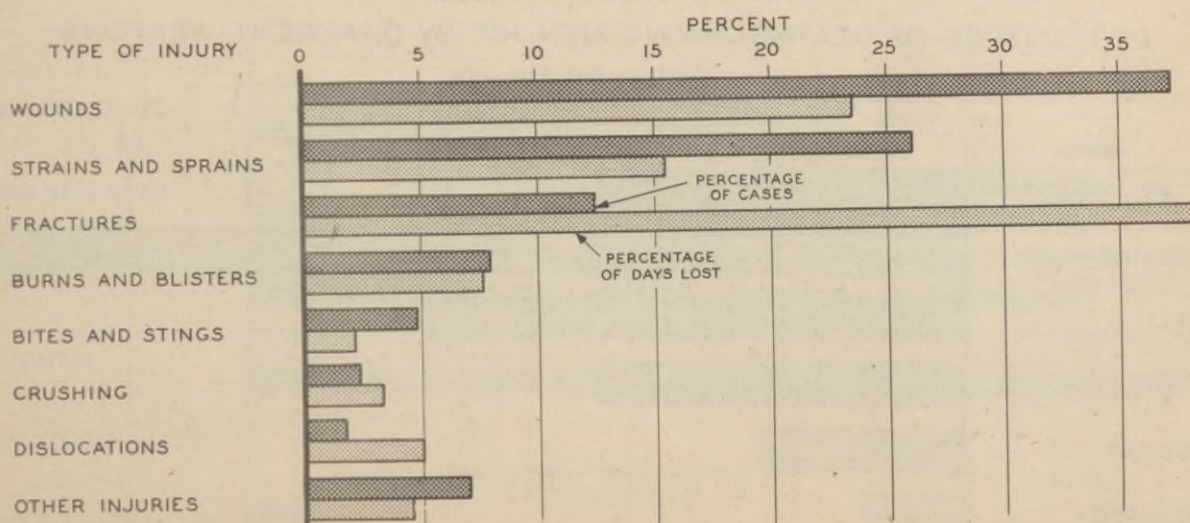
Analysis of theater medical records for 1943 reveals that about 33 percent of the deaths resulted from nonbattle injury, 9 percent from disease, and 5 percent from battle wounds. Deaths from injuries were exceeded only by the number killed in action, which accounted for 53 percent of all the deaths. About 7 percent of the deaths resulting from nonbattle injuries were classified as suicides or homicides, the remainder being accidents. Fifty-four percent of the accidental deaths occurred in connection with air transportation or training. Since this large group represents a special problem of control, together with suicides and homicides it has been excluded from the breakdown of nonbattle injury deaths by causative agent in the table below. The chief causative agents or conditions are then seen to be automobiles, firearms, and drowning.

ACCIDENTAL DEATHS BY CAUSE, SWPA, 1943

Agent	Automobiles	Firearms	Drowning	Falls	Burns	Railroad	Other	Total
Percent	24.8	23.5	19.0	6.2	5.8	5.0	15.7	100.0

Since nonbattle injuries play such a prominent part in noneffectiveness, measures have been introduced by the Southwest Pacific Theater to lower their incidence and the resulting loss of time. A recent directive establishes the post of accident prevention officer in each base area, to be responsible for the inauguration and execution of a control program covering instruction in industrial hygiene, accident prevention, improvement of discipline, and instruction in the care and maintenance of materiel and transportation routes. All accidents, regardless of their severity, are to be reported and investigated. Responsibility will be fixed, penalties imposed where necessary, and disciplinary measures (including reimbursement for damages) taken. The efficiency of the control program of the various base areas will be judged by comparative rates of incidence.

PERCENT OF ADMISSIONS AND DAYS LOST FROM NONBATTLE INJURY BY TYPE  
SOUTHWEST PACIFIC 1943



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DISEASE AND INJURY

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PRELIMINARY DATA ON WOUND BALLISTICS

World War II has seen a beginning in the collection of data on the important subject of wound ballistics, largely neglected by the U. S. Army since the Civil War when some excellent observations were made. From the medical point of view such data are of primary interest from the standpoint of the lethality of weapons, the regional distribution of wounds, the relation between the weapons used and the location of the hits, the severity of wounds by location and causative agent, and the like.

The surgeon of the South Pacific has completed an outstanding study of 1,788 casualties occurring at Bougainville between 15 February and 21 April 1944. The count excludes 547 who were so lightly wounded as to be returned to duty from aid posts. The data are unique in the collection of U. S. material on this war in that they were gathered by a special wound ballistics team organized to conduct studies of this nature. All the ground force casualties were studied, and post mortem observations were made.

Although it is in some ways not directly comparable with the South Pacific data, it is valuable to have for contrast the experience of the 3rd Infantry Division during 66 days of combat at the Anzio-Nettuno beachhead. This sample consists of 3,919 killed and wounded, but it is not known if the very lightly wounded are excluded as in the South Pacific study. The chief point of interest centers upon the contrast between the jungle conditions of the Bougainville campaign and the crowded artillery target presented by the Anzio beachhead. There may be occasional variations in definition which also bear upon the comparison.

A third of all the hits on Bougainville were caused by rifle and machine-gun bullets, and most of the other wounds were caused by mortar shells. In Italy the significance of bullets was much less, and this probably also applies to mortar shells. The distributions obtained from the two studies are tabled below:

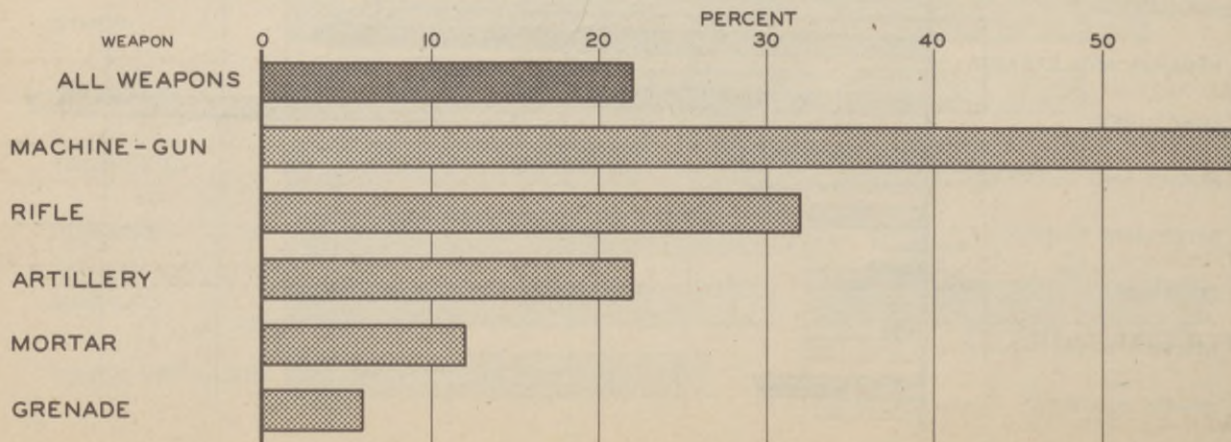
DISTRIBUTION OF TOTAL HITS BY CAUSATIVE AGENT

South Pacific		North Africa	
Agent	Percent	Agent	Percent
Mortar shells	39	Shell fragments	75
Bullets	33	Bullets	20
Rifle	25	Mines	2
Machine-Gun	8	Bombs	1
Shell fragments	11	Other	2
Grenade	12	Total	100
Mines	2		
Other	3		
Total	100		

The gross lethality was 27 percent for all the hits reported from Anzio, and 22 percent for those on Bougainville. When the hits are separated roughly into those caused by bullets and those caused by other missiles, the lethality percentages for bullets are 39 for the South

PERCENTAGE OF DEATHS AMONG MEN HIT BY DIFFERENT WEAPONS

SOUTH PACIFIC



## DISEASE AND INJURY

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## PRELIMINARY DATA ON WOUND BALLISTICS (Continued)

Pacific and 29 for North Africa, those for other missiles being 14 and 26. The Anzio material does not bear out the suggestions of earlier and smaller North African samples to the effect that bullets are more lethal than fragments from high explosives. The more detailed South Pacific data are shown in graphic form on the previous page. It is suggested in the South Pacific study that the lethality percentages bear a direct relation to the velocity of missiles involved, which is in accordance with much of the experimental work being conducted on the ballistics of wounds. The relative order of lethality is maintained within hits on such vital regions as head or chest. The low lethality attending wounds from mortar shells is noteworthy in view of the fact that it was the Japanese weapon most feared by the troops on Bougainville.

Despite the considerable differences in weapons and tactics, the regional distribution of wounds is about the same for the two sets of data, as may be seen from the accompanying table, which also includes a percentage distribution of body surface area.

PERCENTAGE OF HITS AND PERCENTAGE OF BODY AREA BY BODY REGION

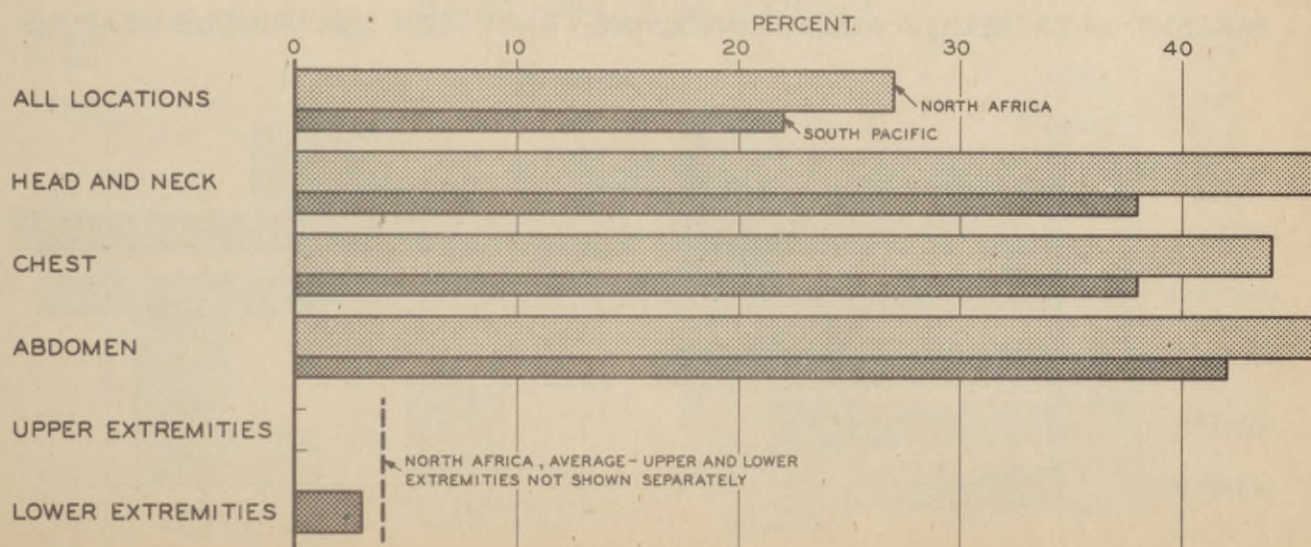
Region	Body Area	South Pacific	North Africa
Head and Neck	12	26.4	21.5
Chest	16	15.9	17.3
Abdomen	11	7.8	9.2
Upper Extremities	22	22.0	) 52.0
Lower Extremities	39	27.9	
Total	100	100.0	100.0

The estimate of body area is different from that given in HEALTH for March, and represents a mean of the projected areas of each region obtained by projection in three positions: standing, sitting, and kneeling. The excess of hits in the head and the deficit in the lower extremities are common to both series. It is believed that this is more a consequence of differential exposure than of directed fire, because the most readily directed missiles, rifle-bullets, strike the head with no greater frequency than would be expected from the regional distribution of all hits in either series. Both samples provide evidence of relationship between weapons and location of hits. The Bougainville data clearly suggest that machine-gun bullets strike the head and neck area less often than do missiles in general, and the abdomen and lower extremities more often than would be expected on this basis. Similarly, hits by grenade fragments involve the lower extremities more than would be expected in this sense. In the Anzio experience, which is not reported in such detail, there are fewer points of significance, the chief one being the preponderance of chest wounds among hits by bullets.

The immediate lethality of hits in the several body areas varies widely, but principally between the extremities and the vital areas. For hits in the head, chest, and abdom-

## PERCENT OF MEN HIT WHO ARE KILLED OR DIE OF WOUNDS, BY LOCATION OF HIT

## NORTH AFRICA AND SOUTH PACIFIC



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DISEASE AND INJURY

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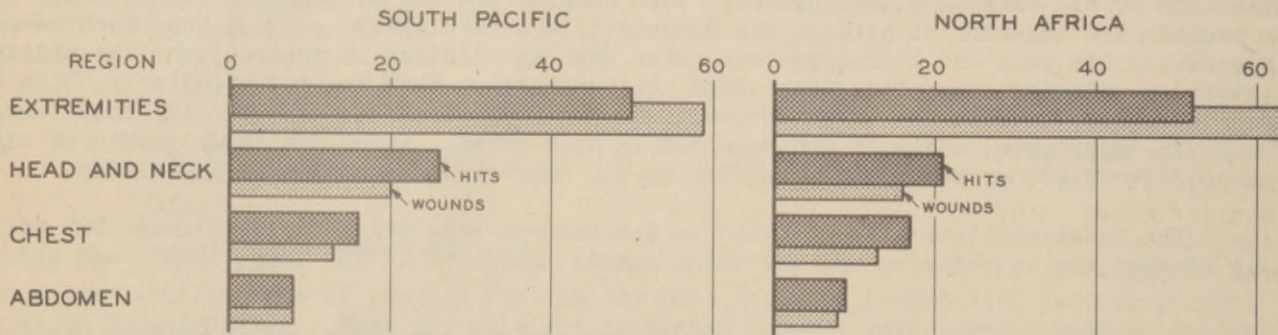
PRELIMINARY DATA ON WOUND BALLISTICS (Continued)

inal regions the average fatality varies little, and is uniformly high, being in the region of 40 percent, or almost twice that for all hits, because the fatality for hits in the extremities is so low. The preceding chart compares the two samples from the standpoint of regional fatality. It is also important to note that the lethality of individual weapons varies little between head and chest wounds. About a third of all the deaths were attributed to rifle-bullets, not so much because these missiles hit vital areas more often than would be expected from the distribution of all hits, as because the only other weapon of appreciable lethality, the machine-gun, had a relative deficit of head hits and a surplus of hits in the lower extremities. The proportion of all the deaths attributable to a given weapon depend not only upon its lethality but also upon its success in making hits. Region for region the machine gun was more lethal than the rifle, but more hits, and especially more hits in the head, were made by the latter. Another consequence of the high fatality attending hits upon vital areas, and of the frequency with which the head region was hit, is the great preponderance of head injuries among those killed in action. In the Bougainville experience the head was primarily involved in 52 percent of those killed. In the Anzio material the figure is 45 percent.

Immediate death results so frequently from wounds of the head and chest that the regional distribution of wounds is somewhat different from the regional distribution of all hits, as may be seen from the accompanying chart.

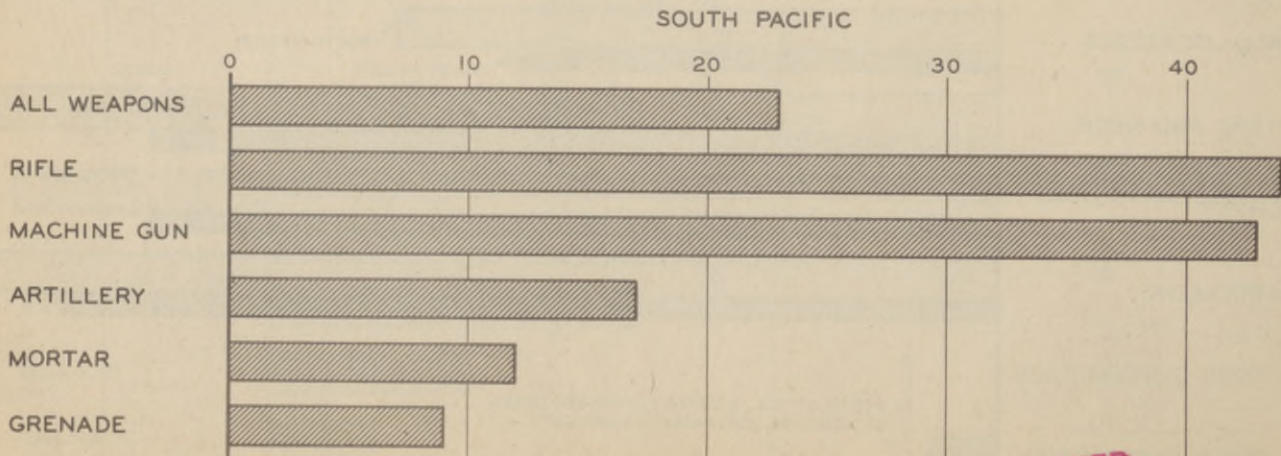
The importance of weapons may also be measured by the severity of the resulting wounds among those living to receive medical attention. In the Bougainville study 23 percent of the wounds were called "serious". As in the case of fatality, this criterion also points to the rifle and the machine-gun as the more potent weapons used by the Japanese. Mortar-fire caused far fewer serious wounds than would have been expected on the basis of the average proportion for all weapons. A third criterion is the proportion of fractures among extremity wounds, and this also points to the same conclusion, as illustrated by the chart below.

PERCENTAGE DISTRIBUTION OF ALL HITS\* AND OF ALL WOUNDS



\* Hits include wounded, killed, and died of wounds.

PERCENT OF EXTREMITY WOUNDS INVOLVING FRACTURES, FOR VARIOUS WEAPONS



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## PROTECTION FROM BODY ARMOR

The incidence of fatal wounds in body areas readily protected without serious impairment of mobility serves constantly to stimulate thought and experiment with body armor. The modern steel helmet, however, is the only piece of armor generally accepted as both necessary and desirable for ground troops. Many suggestions have been made for the development of a light-weight armor which would be acceptable to the wearer and able to protect him against low and medium velocity fragments otherwise likely to cause serious injury or death. Only for flying personnel, however, has body armor been acknowledged as practical in World War II.

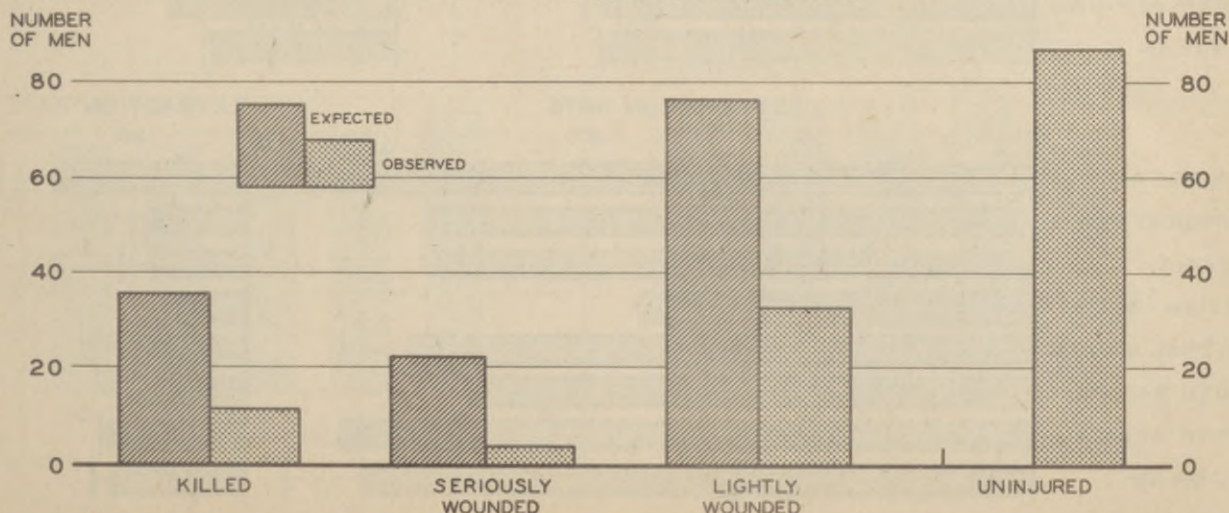
The field of flak is composed in large part of fragments of such velocity that body armor would be expected to afford considerable protection to combat crews under attack from the ground. During 1942 and 1943 experimental work with various types of protective device evolved a flexible jerkin loaded with small steel plates individually sewn in place. Although one of the arguments for body armor has been the likelihood that it might enhance the morale of troops, the institution of the flak suit, as it came to be called, met with initial resistance from the heavy bomber crews for whom it was designed. However, its protective powers were sufficient to overcome their objections and flak suits are now available in ample quantities for bomber crews of the Eighth Air Force, the surgeon of which deserves great credit for having made the idea of body armor a workable instrument in saving lives and reducing injuries.

A recent report from the headquarters of the U. S. Strategic Air Forces in Europe provides data on the outcome of 133 instances in which men wearing flak suits were struck by enemy missiles in the areas covered by the armor. Only 11 were killed, 3 seriously injured, and 32 lightly wounded. Eighty-seven, or 65 percent were uninjured. No precise estimate can be readily made for the numbers who would have been killed, seriously wounded, and slightly wounded had armor not been worn, but a rough approximation is presented in the accompanying chart, which serves more to illustrate than to prove the value of the armor. A ratio of 26 killed to 74 wounded was derived from Care of Flyer reports as an estimate of the relative fatality attending hits by enemy missiles. This ratio is close to comparable ground force figures, although the AG figures for Air Corps, including many deaths from crashes, etc., yield a ratio of 56 killed to 44 wounded. The wounded component was then subdivided into serious and slight wounds according to the casualty statistics of the Fifth Army. On this basis it would be expected that 133 hits would subdivide as follows: 35 killed; 22 seriously wounded; and 76 lightly wounded. The expected number of killed would be even larger were it possible to restrict the comparison to those locations covered by the armor.

The increasing use of the flak suit should result in the saving of many lives and in the return to duty of many men whose injuries would otherwise have proved incapacitating. Its success gives reason to pause and reconsider the possibility of providing analogous protection to other specialists within the Army whose immediate mobility on foot need not be assured at any cost.

## INJURIES AND DEATHS EXPECTED AMONG MEN HIT BY ENEMY FIRE AND OBSERVED INCIDENCE FOR MEN WEARING BODY ARMOR

8TH AIR FORCE, FLYING PERSONNEL



# DISEASE AND INJURY

## DENTAL ADMISSIONS AND TREATMENT, OVERSEAS THEATERS

The average number of dental officers in all overseas theaters for the five months ending in May 1944 was 1.3 per 1,000 strength or one dental officer for every 783 men. This represents a slight increase over the corresponding figures of 1.2 and 842 for the period July through December 1943. The ratio of dental officers to strength should be an index of the amount of dental work which can be done in a command, but many other factors are also operative, especially combat and training activity, movement and dispersion of troops, supplies and equipment, and the dental health of the command.

Since the many shortages in supplies and equipment overseas have been relieved, more dentures are now being made. The average number of new dentures now amounts to 4.1 per thousand strength per month while repairs are reported to be 2.2 per thousand per month. The accompanying chart compares the 1943 and 1944 experience against the background of the ratio of dental officers to strength.

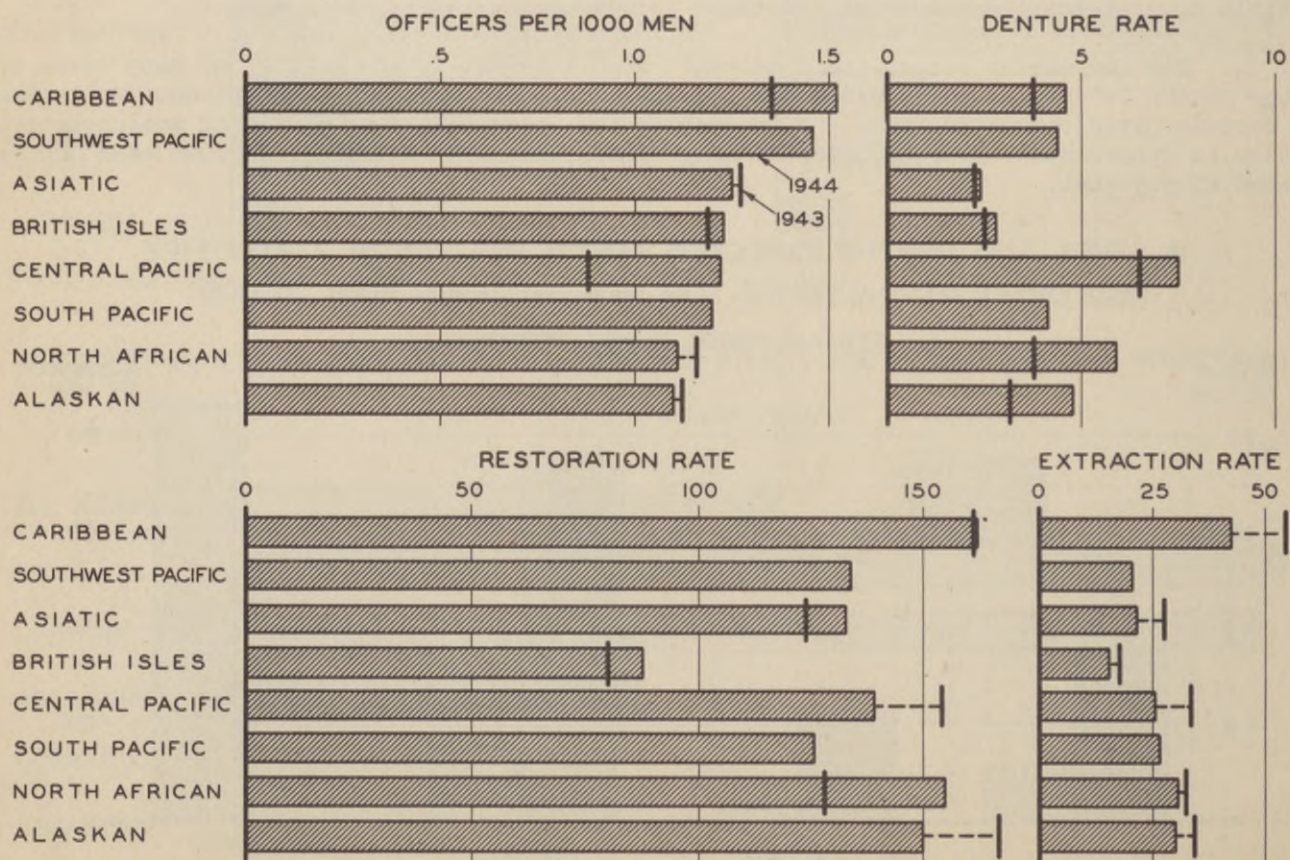
The necessity for extractions has been lessened by the accelerated induction of men in the younger age brackets, and by better screening of Class I emergency dental patients prior to overseas movement. A substantial reduction has also been made in the backlog of patients requiring such service. Both in the U. S. and overseas generally, therefore, extraction rates for 1944 are lower than those for 1943, and this is true in each theater shown below. Comparable data are also shown for restorations.

The incidence of Stomatitis Vincent's has been consistently low in all overseas areas except the British Isles, where the high rate of 6.3 for the second half of 1943 has been replaced by the lower rate of 4.1 admissions per 1,000 strength per month.

There is a fairly close relation among the three indices of dental work shown in the charts below, with Alaska and North Africa doing surprisingly well in view of their lower ratios of dental officers to strength. For the South and Southwest Pacific, 1943 data are not available.

### DENTAL OFFICERS PER 1000 STRENGTH, AND DENTAL TREATMENTS PER 1000 MEN PER MONTH, OVERSEAS COMMANDS

JUL - DEC 1943 AND JAN - MAY 1944



HOSPITALIZATION

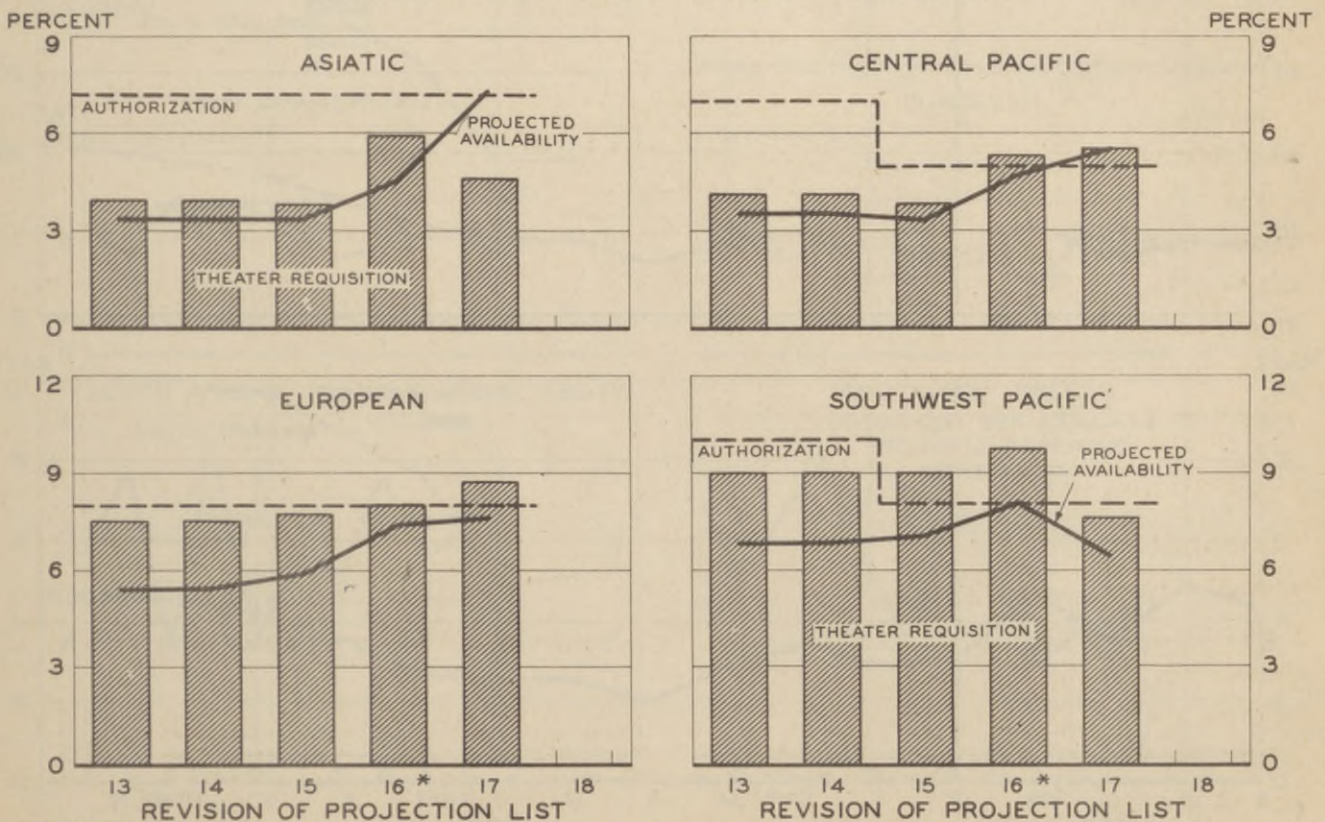
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PROVISION OF FIXED HOSPITALIZATION OVERSEAS

Considerable progress has been made in the direction of meeting theater requirements for fixed bed units since the May issue of HEALTH. Sufficient personnel was authorized to preactivate 47 general hospitals during June and 8 during July to bring the total activations and preactivations to 212 type units. Two general hospital units are scheduled for preactivation in August, and there is a possibility of 11 additional units. This number of units would meet the numerical requirements of the current six months forecast for general hospitals. But because personnel was not available soon enough, many of the units will not complete their training in time to meet the monthly schedules requested by the theaters. Their shipment prior to completion of training, at theater request, is inevitable in some cases. In addition to the general hospitals there were 16 field hospitals preactivated during June and 8 in July, bringing the total activated and preactivated to 94 field hospitals. This number also will suffice to meet the total requirement of the current six months forecast, but the training of all the additional units cannot be completed in time to meet the required shipping dates set by the theaters. The requirement for station hospitals is being met.

The accompanying charts show how much progress has been made in meeting the theater demands for 31 December 1944. The December points of each successive revision of the WD Six Months Troop Forecast are plotted for the more important theaters. For example, under the 13th revision, it was estimated that fixed bed units equivalent to 5.4 percent of strength could be put into the European Theater by 31 December, the request of the theater being 7.5 percent for that date and the WD D/CS authorization being 8.0 percent. By the 17th revision the projected availability figure was 7.6 percent, and the theater request 8.7 percent. All these figures are percentages of 31 December strength estimates employed in the particular revision, except that the data for the 16th revision pertain to 31 January 1945. The projected availability figures shown in the charts are based upon shipment at the completion of the training period. In North Africa a stable condition has been reached, with all requirements met, so that no panel has been prepared for this theater. The recent decline registered for the Southwest Pacific derives from a change in the strength forecast for 31 December. The picture in Asia and in the Central Pacific has been largely improved by diversion of beds from the South Pacific.

PROJECTED AVAILABILITY OF FIXED HOSPITAL UNITS OVERSEAS  
BEDS AS PERCENT OF STRENGTH, 31 DECEMBER 1944



\* 31 January 1945.

# HOSPITALIZATION

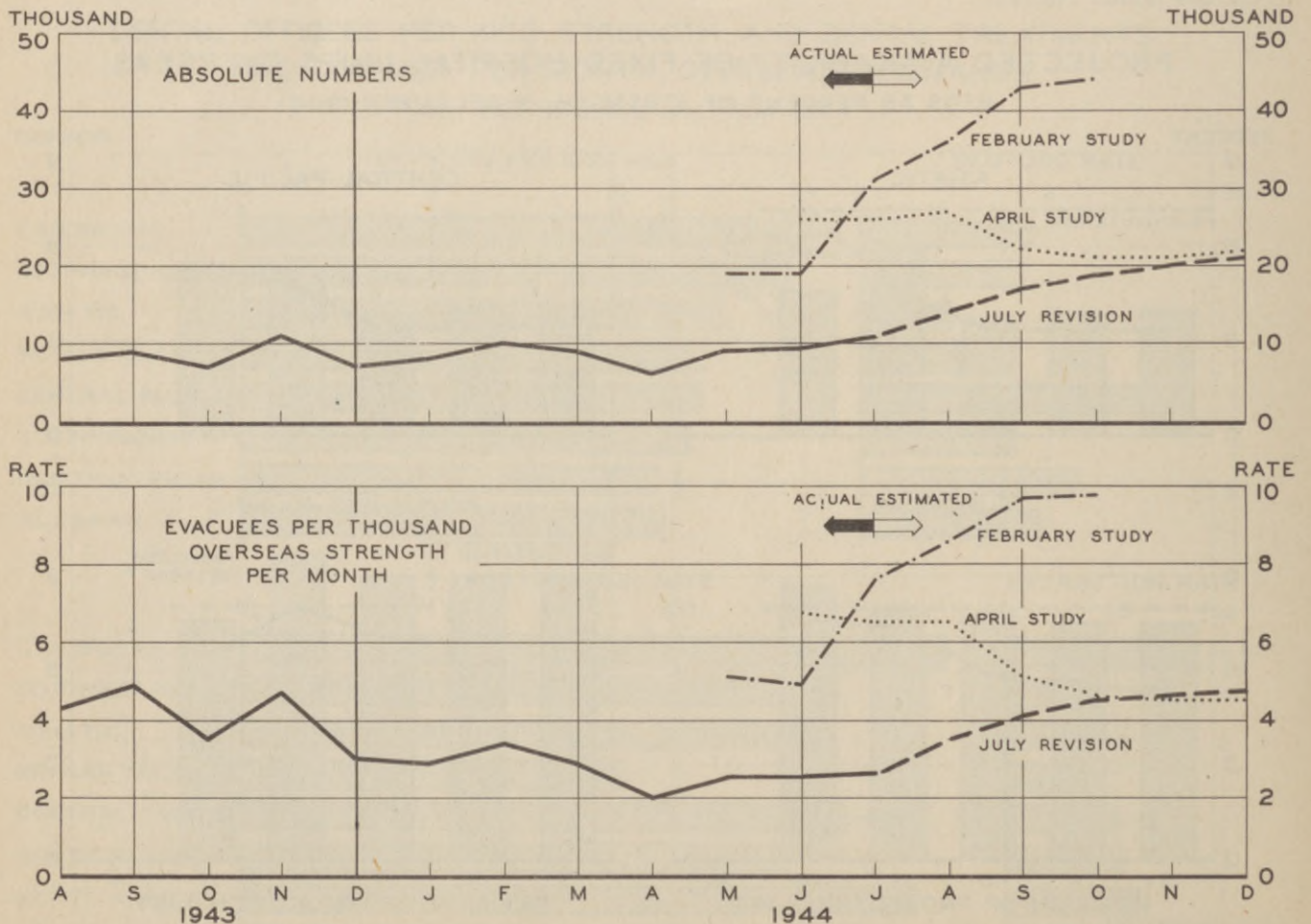
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## EVACUATION FROM OVERSEAS

The provisional estimate of the volume of evacuation to the U. S. during June, shown in HEALTH for that month, proved excessive, for the final report is that only about 9,700 were received. Air figures for July are not yet available, but 6,900 patients are reported to have arrived by water during July. If the air component rises from 2,200 to about 3,500 the total for July will be 10,400 evacuees, or about 2.6 per 1,000 overseas strength. Although this tentative estimate is short of the forecast made in May it is known that the backlog of patients awaiting in overseas ports is building up.

The problem of estimating the number of evacuees likely to arrive in the U. S. is rendered particularly difficult by the unreliability attached to long-range casualty estimates, but even rough approximations are of value if used as such. The forecasts for 1944 which were made in May have been revised on the basis of recent casualty data and are shown in place of the revision of the two earlier estimates described in HEALTH for May 1944. The new estimates were prepared by projecting 1943 nonbattle admission rates against estimated strengths for the balance of 1944, except that the rates for the European Theater and for the Central Pacific were adjusted upwards, and the 1943 experience of the Southwest Pacific was used for the South Pacific. The proportions of evacuees among the admissions for five months ending January 1944 were obtained for each theater separately for disease and nonbattle injury and applied to the calculated admissions for the rest of the year. For the projected battle casualties it was assumed that 20 percent would be evacuated, but it is possible that this figure may prove too low because of the planned reduction in the evacuation policy of the European Theater and because of the shortages of numbered units requisitioned by overseas commands. A lag of two months was assumed between admission and evacuation. The resulting forecasts, which are to be taken as merely suggestive, are about 10 percent lower than the May revision. It should be borne in mind that an abrupt end of the war in Europe would probably result immediately in the evacuation of larger numbers than are shown here on the assumption of its continuation.

## ACTUAL AND ANTICIPATED EVACUATION OF PATIENTS FROM OVERSEAS





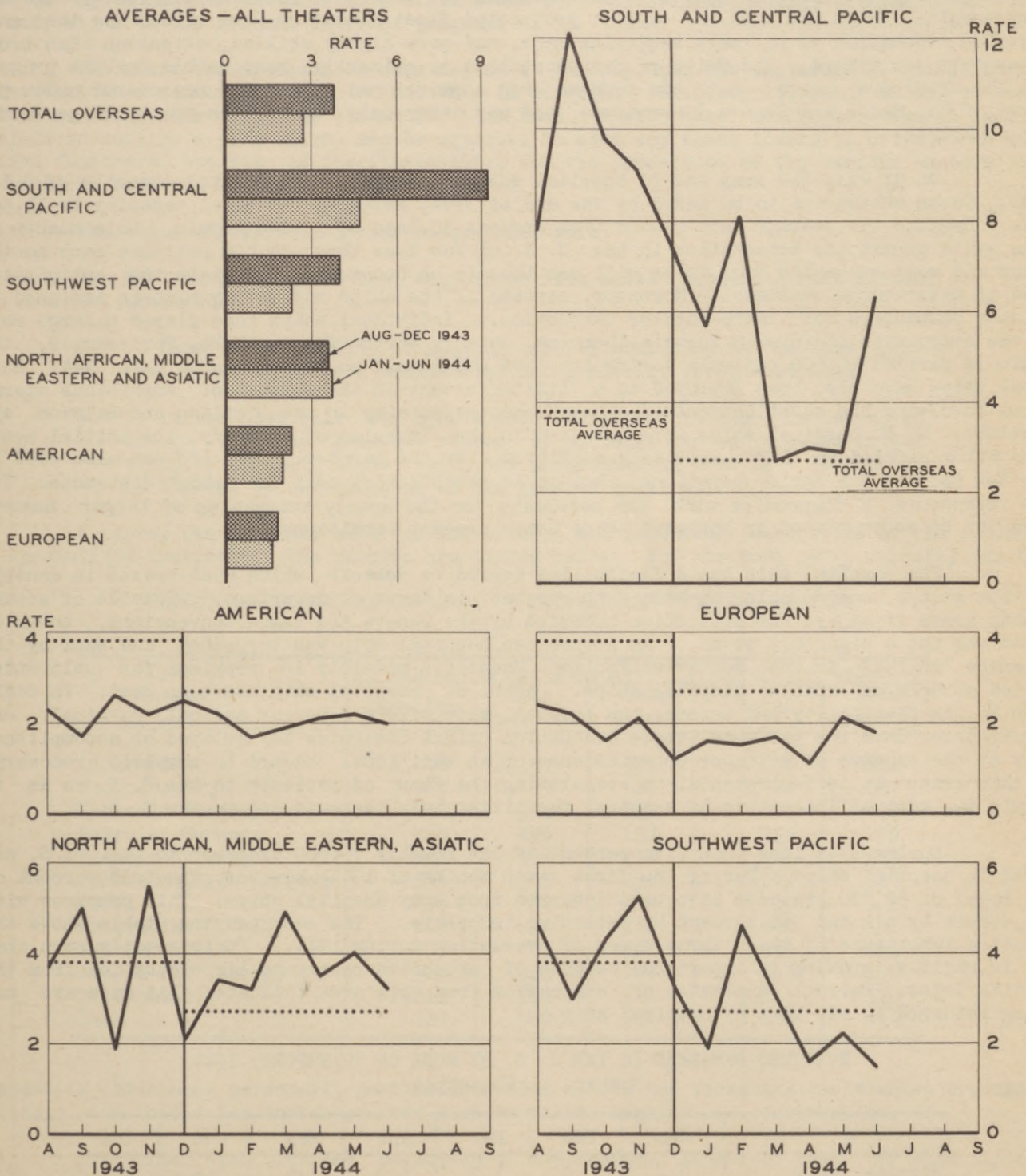
# HOSPITALIZATION

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## EVACUATION FROM OVERSEAS

In extension of the data shown on the previous page, the panels in the chart below compare evacuation rates per thousand strength per month for each individual theater, or group of commands, with the average experience of all theaters combined. The horizontal lines in each panel represent the average rate for all theaters for the period indicated. The Pacific Theater, especially its South Pacific section, which long maintained a 60-day evacuation policy, has had a considerable effect upon the total overseas rate in the past. However, the rate for this theater declined fairly steadily from September 1943 to March 1944, and until June it closely approximated the average rate for all theaters. In June, on the other hand, it rose sharply.

## EVACUEES PER THOUSAND STRENGTH PER MONTH, OVERSEAS THEATERS



## HOSPITALIZATION

~~SECRET~~EVACUATION BY HOSPITAL SHIP

Army hospital ships play an important role in the evacuation of patients within certain theaters and especially in the return of evacuees to the U. S. The volume of evacuation necessary by water is so great, however, that it is manifestly impossible of accomplishment solely by hospital ships. The return of patients to the U. S. by this means alone would require perhaps 50,000 beds, or 80 hospital ships of the present average size, even will allowance for a certain amount of air evacuation. Yet the provision of hospitalization overseas must be predicated upon the early return to the U. S. of thousands of helpless litter patients in addition to the many more who require less elaborate medical attention. It was for this reason that the decision was made in 1942 to construct three new hospital ships for Army operation. By 1943 overseas commanders were asking for hospital ships. An expanded program was then devised to accomplish the construction or conversion of a fleet which would total 24 hospital ships. They were not planned as elaborate floating hospitals, like the Navy hospital ships designed to support protracted fleet maneuvers, but rather for the comfortable evacuation of patients requiring more, and more highly skilled, attention than troop transports can afford. The Chief of Transportation is primarily responsible for the program and the ships are placed under his command when commissioned. They are registered under the terms of the Hague and Geneva Conventions and may carry only Convention-protected personnel and equipment.

On 31 July the Army had 17 hospital ships in service with a total capacity of 9,500 beds. Seven others are to be added by the end of 1944, bringing the total capacity to 14,600 beds. Because the average turn-around time exceeds 30 days by a wide margin, this number of beds would permit the debarkation in the U. S. of far less than 14,600 patients each month. Other and more extensive facilities will continue to be necessary to sustain the anticipated load of water-borne evacuees. Moreover, certain of the ships may at any time be assigned to theater commanders for intra-theater evacuation. Individual ships have played a large role in the evacuation picture in certain theaters, notably North Africa, where, for example, the Seminole carried 10,500 patients during the five and a half months ending 10 July 1944. Hospital ships have also been employed to a limited extent in the support of amphibious operations involving the establishment of a beachhead, especially in the Sicilian and Salerno operations. U. S. hospital ships were not used in the invasion of Normandy, the initial evacuees being carried in LST's specially outfitted for the purpose. The LST was also used in the New Georgia and Anzio operations, but it is satisfactory only for short distances. Its use represents a compromise with the necessity for the speedy evacuation of larger numbers than can be accommodated by hospital ships under present conditions.

The hospital ship has a flexibility denied to vessels which must travel in convoy. It thus enjoys considerable freedom with respect to dates of departure. Outside of actual combat zones it enjoys the protection afforded by the Geneva and Hague Conventions, to which Japan was not a signatory power. An Australian hospital ship was torpedoed and sunk by the Japanese in 1943 in the Southwest Pacific Theater, possibly in reprisal for unintended Allied attacks on Japanese hospital ships. No U. S. hospital ship has been lost. In addition to its flexibility and safety, the hospital ship offers superior medical, surgical, and psychiatric care for patients whose evacuation might otherwise be delayed or accomplished only at the expense of a longer convalescence or an additional hazard to complete recovery. In this sense it is instrumental in regulating the flow of patients to the Z. I. so as to permit the most efficient use of hospital facilities both overseas and in the U. S.

During 1943 less than five percent of the roughly 70,000 evacuees to the U. S. arrived in hospital ships. During the first seven months of 1944, however, about 18 percent of the total of 62,500 evacuees have been debarked from Army hospital ships. This compares with 16 percent by air and 66 percent by returning troopship. The accompanying table shows the relative importance of these three types of evacuation during 1944. It is readily seen that air is rapidly growing in importance because of extensive resort to air evacuation from the British Isles. Current estimates of evacuation from this area indicate that more are now being returned by air than by hospital ship.

EVACUEES DEBARKED IN THE U. S. BY MODE OF TRANSPORT, 1944  
Number, in Thousands

	Jan	Feb	Mar	Apr	May	Jun	Jul
Hospital Ship	1.1	.0	1.7	1.2	3.5	1.4	2.5
Air	.5	.5	.7	.8	1.7	2.2	3.5*
Troop Transport	5.8	9.0	6.4	5.0	4.5	6.1	4.3

\* Estimated

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# HOSPITALIZATION

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## SPECIALIZED HOSPITALS IN THE U. S.

One conspicuous difference between this war and World War I with respect to hospitalization in the Zone of Interior is the greater recognition of the need for specialized medical and surgical care. This development reflects the increasing specialization which has become characteristic of all branches of medicine during the intervening decades, and which has been partly responsible for the great progress of medicine and surgery during this period.

At the beginning of the war the Army had only 6 general hospitals in comparison with 60 today. The last of the general hospitals is about to go into operation. Because of the fact that general hospitals have been activated over a period of years, designation of certain hospitals for specialized treatment had to be made as the need arose rather than in terms of any definitive estimate of overall needs for specialized beds which might exist at the completion of the general hospital program.

The needs for specialized care depend so largely upon the incidence of battle casualties that they cannot be known definitively in advance. However, review of the experience to date provides more reliable estimates than have hitherto been available, and it is now possible to outline a plan which may be expected to meet any needs likely to arise. An essential feature of the plan is its flexibility, for the capacities of the various centers can be varied in response to need.

The basic objectives of this re-estimate were:

1. To insure adequate bed capacities for cases requiring specialized treatment;
2. To improve the quality of medical care by combining in the same general hospital certain specialties not presently associated; and
3. To locate hospitals for specialized treatment in such manner as to insure that the greatest number of patients may be treated in the vicinity of their homes, with the understanding that this objective is limited by the location of the general hospitals.

A survey was recently made of the present and potential capacities of the centers for specialized treatment. The results are listed below. For the most part, capacity can be

### PRESENT AND POTENTIAL CAPACITY OF SPECIALIZED CENTERS, BY TYPE

Type of Specialty	Status on 26 June 1944			Potential Capacity	
	Capacity	Beds Occupied	Beds Vacant	Total	Beds Vacant
Amputation	1,470	1,159	311	2,020	861
Neurosurgery	3,044	2,423	621	3,710	1,287
Thoracic Surgery	630	391	239	811	420
Vascular Surgery	334	196	138	395	199
Plastic Surgery	868	594	274	1,561	967
Ophthalmologic Surgery	536	305	231	1,042	737
Blind	50	52	- 2	50	- 2
Arthritis	600	444	156	600	156
Neurosyphilis	755	88	667	1,050	962
Deep X-ray Therapy	326	221	105	401	180
Tuberculosis	1,211	901	310	1,211	310
Deaf	727	560	167	1,004	444

expanded if additional personnel, particularly specialists and technical assistants, are made available. In only a few instances does such expansion require new construction.

The survey also provided estimates of the average length of stay for specialized cases, as shown on the following page.

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# HOSPITALIZATION

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## SPECIALIZED HOSPITALS IN THE U. S. (Continued)

### AVERAGE DAYS OF HOSPITALIZATION FOR SPECIALIZED CASES, BY TYPE

Type of Specialty	Overseas and En Route	Z. I.	Total, Including Convalescence
Amputation	83	184	267
Neurosurgery	97	261	358
Thoracic Surgery	85	193	278
Vascular Surgery	57	181	238
Plastic Surgery	69	311	380
Ophthalmologic Surgery	36	201	237
Blind	71	263	334
Arthritis	69	155	224
Neurosyphilis	32	146	178
Deep X-ray Therapy	53	144	197
Tuberculosis	74	285	359
Deaf	41	120	161

On the basis of the anticipated total number of evacuees to be debarked in the U.S. between now and the end of 1944, and of an analysis of a sample of recent evacuees, a large deficit was forecast for the capacities of the specialized centers. The estimates are shown below.

### PRELIMINARY ESTIMATES OF NEED FOR SPECIALIZED CENTERS, BY TYPE

Type of Specialty	Patient Load	Potential Capacity, Present Facilities	Anticipated Deficit
Amputation	4,750	2,020	2,730
Neurosurgery	9,250	4,379	4,871
Thoracic Surgery	900	877	23
Vascular Surgery	850	470	380
Plastic & Ophthalmic Surgery	3,500	2,600	900
Blind	600	50	550
Deaf	Unknown	1,004	Unknown
Arthritis	2,000	600	1,400
Tuberculosis	2,750	1,711	1,039
Deep X-ray Therapy	500	589	+ 89
Neurosyphilis	Unknown	1,050	Unknown

The most efficient manner of overcoming these potential deficits is to raise the ceilings of individual centers considerably above their present maximum. It is more economical to increase the number of neurosurgical patients from 250 to 500 than to open a new neurosurgical center. The same is true of the other specialties. For the following specialties, the estimated deficits are so large that additional centers must be established:

Amputation  
Plastic Surgery  
Arthritis  
Tuberculosis

The establishment of regional hospitals insures that most medical patients in the Zone of Interior needing the general hospital type of care will no longer be transferred to a general hospital but will be treated in regional hospitals. The evacuation estimates disclose that the percentage of medical cases will decline as the number of troops in combat in-

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# HOSPITALIZATION

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## SPECIALIZED HOSPITALS IN THE U.S. (Continued)

creases. Because of the acute shortage of medical specialists, it is more economical and efficient to concentrate patients needing specialized medical care in a limited number of general hospitals. This development parallels the concentration of psychotic patients in a limited number of psychiatric centers. Experience has also disclosed the need for establishing neurology as a specialty at every neurosurgical center, since a considerable number of patients presently classified as neurosurgical are primarily neurological in character. Patients with tropical diseases are sufficiently numerous to warrant the designation of a tropical disease center not only for patient treatment but also for research designed to reduce the toll of noneffectiveness from these causes. The incidence of rheumatic fever is likewise sufficiently great to warrant the designation of three rheumatic fever centers.

The foregoing steps insure the accomplishment of the first objective, which is the establishment of adequate capacities for the treatment of specialized cases. The second objective of improving the quality of medical treatment is to be realized by insuring that, to the maximum degree possible, there will be at least two surgical specialties at each general hospital designated for specialized surgical treatment. In the case of centers devoted to the treatment of such specialized medical conditions as arthritis, tuberculosis, and rheumatic fever, care has been taken to provide a general medical service at these same hospitals. Realization of the third objective, that of locating the specialized centers so that the majority of the patients can be hospitalized as near their homes as possible, is limited by the following factors:

1. About 27 percent of the population lives in New England, New York, Pennsylvania, and New Jersey, but only 13 percent of the general hospital beds available for definitive treatment are located in this area. On the other hand, although Oklahoma, Texas, New Mexico, Arizona, Utah, California, Colorado and Nevada account for only 14 percent of the population, almost 32 percent of the general hospital beds are located in these states. This imbalance has resulted partly from the necessity for locating general hospitals where they could best serve the military population of the large training areas, and also from the early efforts to place many hospitals behind the mountain ranges within a zone of maximum security.
2. There can be only a limited number of centers for amputation, tuberculosis, thoracic surgery, and several other specialties.

It is inevitable, therefore, that most patients needing specialized care will have to be hospitalized some distance from their homes. In general, the redesignation of specialized centers seeks to accomplish the greatest good for the greatest number by providing approximately the same number of specialized hospital beds in shortage areas as there are general hospital beds. General hospitals such as Lovell, Tilton, Vaughan, and Crile, which are in close proximity to metropolitan centers in "bed-shortage" areas, have not been designated for surgical specialties in order that more patients might be treated in the immediate vicinity of their homes. On the average, medical patients have a much shorter duration in hospitals than do specialized surgical cases.

The table on the following pages summarizes the new plan for specialized hospitals in the Zone of the Interior. In working out the revision every effort has been made to limit the number of changes so as to minimize the costs involved in moving patients and in disrupting professional services already operating efficiently.

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# HOSPITALIZATION

## SPECIALIZED GENERAL HOSPITALS

Hospital and State	Service Command	Surgery								Vascular**
		Amputation	Neuro-surgery	Thoracic	Plastic*	Blind*	Deaf	Deep X-Ray	Radium	
Army and Navy, Ark.	8							X	X	
Ashburn, Texas	8									
Ashford, W. Va.	5		X							X
Baker, W. Va.	5		X		X					
Barnes, Wash.	9									
Batley, Ga.	4									
Baxter, Wash.	9			X						
Beaumont, Texas	8				X			X		
Billings, Ind.	5									
Birmingham, Calif.	9									
Borden, Okla.	8						X			
Brooke, Texas	8		X	X				X		
Bruns, New Mexico	8									
Bushnell, Utah	9	X	X					X		
Crile, Ohio	5									
Cushing, Mass.	1		X		X					
Darnall, Ky.	5									
Deshon, Pa.	3						X			
DeWitt, Calif.	9		X							X
Dibble, Calif.	9				X	X				
England, N. J.	2	X	X							
Finney, Ga.	4									
Fitzsimons, Colo.	7			X				X		
Fletcher, Ohio	5									
Foster, Miss.	4									
Glennan, Okla.	8									
Halloran, N. Y.	2									
Hammond, Calif.	9		X							
Harmon, Texas	8									
Hoff, Calif.	9						X			
Percy Jones, Mich.	6	X	X					X		
Kennedy, Tenn.	4		X	X						
LaGarde, La.	8									
Lawson, Ga.	4	X	X					X		
Letterman, Calif.	9							X	X	
Lovell, Mass.	1									
Mason, N. Y.	2									
Mayo, Ill.	6		X							X
McCloskey, Texas	8	X	X							
McCaw, Wash.	9		X							
Moore, N.C.	4									
Nichols, Ky.	5		X							
Northington, Ala.	4		X		X					
Oliver, Ga.	4									
O'Reilly, Mo.	7		X		X					
Rhoads, N. Y.	2									
Schick, Iowa	7									
Stark, S. C.	4									
Thayer, Tenn.	4									
Tilton, N. J.	2									
Torney, Calif.	9									
Valley Forge, Pa.	3				X	X				
Vaughan, Ill.	6									
Wakeman, Ind.	5		X		X					
Walter Reed, D. C.	MDW	X	X	X				X	X	
Winter, Kans.	7									
Woodrow Wilson, Va.	3									

\* And Ophthalmologic Surgery.

\*\* Both Surgical and Medical.

# HOSPITALIZATION

## SPECIALIZED GENERAL HOSPITALS

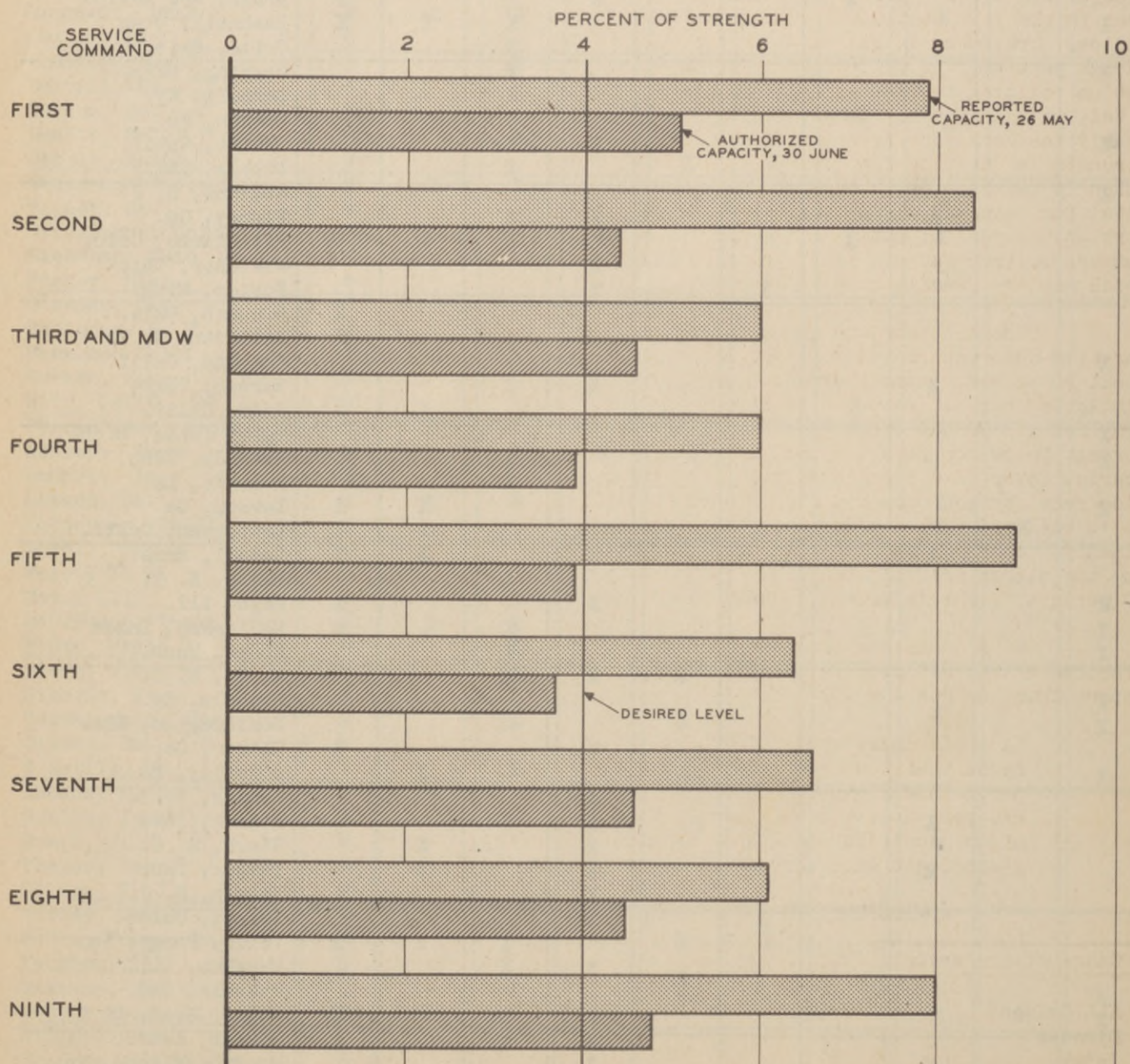
Medicine									Prisoner of War	Hospital and State
Neurology	Arthritis	Neurosyphilis	Tuberculosis	Rheumatic Fever	Tropical	General	Psychiatry	Histopathology		
X X	X X					X X X	X	X		Army and Navy, Ark. Ashburn, Texas Ashford, W. Va. Baker, W. Va. Barnes, Wash.
						X X	X X	X X	X	Battley, Ga. Baxter, Wash. Beaumont, Texas Billings, Ind. Birmingham, Calif.
X X		X	X	X		X	X X X	X X	X X	Borden, Okla. Brooke, Texas Bruns, New Mexico Bushnell, Utah Crile, Ohio
X X						X	X X			Cushing, Mass. Darnall, Ky. Deshon, Pa. DeWitt, Calif. Dibble, Calif.
X		X	X	X		X X X X	X X	X	X	England, N. J. Finney, Ga. Fitzsimons, Colo. Fletcher, Ohio Foster, Miss.
X		X				X	X		X X	Glennan, Okla. Halloran, N. Y. Hammond, Calif. Harmon, Texas Hoff, Calif.
X X X							X X			Percy Jones, Mich. Kennedy, Tenn. LaGarde, La. Lawson, Ga. Letterman, Calif.
X X X		X				X	X X X	X	X X	Lovell, Mass. Mason, N. Y. Mayo, Ill. McCloskey, Texas McCaw, Wash.
X X X					X	X	X X		X	Moore, N. C. Nichols, Ky. Northington, Ala. Oliver, Ga. O'Reilly, Mo.
		X X				X X X X	X	X X		Rhoads, N. Y. Schick, Iowa Stark, S. C. Thayer, Tenn. Tilton, N. J.
X X				X		X X X	X X	X	X	Torney, Calif. Valley Forge, Pa. Vaughan, Ill. Wakeman, Ind. Walter Reed, D. C.
		X				X X	X		X	Winter, Kans. Woodrow Wilson, Va.

# HOSPITALIZATION

## STATION HOSPITALS IN THE U. S.

Considerable progress has been made in deflating station hospital capacity in accordance with declining Z. I. troop strength. The device employed was the institution of "authorized" bed capacity, usually 4 percent of the strength actually served, including any at nearby stations. By allotting personnel and supplies on the basis of authorized beds it should be possible to deflate station hospital personnel and facilities to proper size. The accompanying chart registers the administrative changes which the new ruling has effected. On 26 May the reported bed capacity of station hospitals was 6.7 percent of Z. I. strength; by 30 June it had fallen to 4.3 percent. The station hospital components of regional and general hospitals are not counted separately, and have been estimated at 3.6 percent of the strength of the post to which primary hospitalization is afforded. The breakdown by service command shows, however, some apparent excess of station hospital capacity (or its equivalent in regional or general hospitals) in all but the Fourth, Fifth, and Sixth service commands. Part of the discrepancy may result from failure to report authorized capacity and the substitution of constructed capacity therefor. Fluctuations in the strength of staging areas also have some bearing upon the comparison.

AVAILABILITY OF STATION HOSPITAL BEDS BY SERVICE COMMAND





## MISCELLANEOUS

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HEALTH OF THE WAC

Since April 1944 all stations in the Zone of the Interior having a WAC strength of 300 or more have submitted separate reports on the health of WAC personnel. These reports, covering about one-half of the total strength of the WAC, now make it possible to present a comparative picture of the health of the WAC in the U. S.

For the four-month period ending with July, the WAC experienced annual admission rates of 973 per 1,000 per year for all causes, and 892 for disease. These rates are 65 to 70 percent higher than comparable rates for all Army personnel in the U. S. The higher morbidity of the WAC need occasion no concern, for it is but one more illustration of a characteristic difference between the sickness rates of men and women. Absenteeism among women in industry is reported to be about 65 percent higher than that for men during the period from 1933 through 1942. In some industries, e.g. public utilities, absences for sickness or injury among women were nearly double those for male employees. Furthermore, insurance company statistics also indicate that morbidity rates for women are from 50 to 100 percent higher than those for men. The Army must expect this differential and make any necessary adjustments which it may demand.

The significance of the differential is less than its magnitude might suggest, for much of the excess morbidity seems to represent minor ailments. Some evidence for this is seen in the fact that early in June approximately 30 percent of the WAC admissions received medical treatment in quarters in contrast to the parallel figures of 8 percent for men, although part of the differential is undoubtedly accounted for by differences in hospitalization policies for WAC and male Army personnel. In consequence, the admission rate to hospital, which might be considered an indication of more serious illness and injury, was more nearly the same for both men and women. Moreover, in recent months the proportion of WAC strength in station hospitals has been below the figure for the entire Army in the U. S. Taken in relation to the admission rate, this finding implies a shorter average stay in hospital for the WAC, and parallels the findings of a shorter average period of absence from work on the part of women in industry. A shorter length of hospitalization suggests that members of the WAC are being admitted for conditions which are less serious than those for which men are usually hospitalized.

The less serious character of the higher morbidity of the WAC is borne out by comparative admission rates for particular diseases. Thus, colds, influenza, etc. have been about 70 percent more frequent among the WAC than among Army troops in the U. S. in general. Similarly, the WAC rate for diarrheal complaints has been more than double the corresponding Army rate. On the other hand, the incidence of pneumonia among the WAC has been about 40 percent below the rate for men, and such common communicable diseases as measles, mumps, and scarlet fever have been less frequent among members of the WAC. Even though the WAC admission rate for neuropsychiatric disorders has been about 30 percent higher than that for men, it is believed that most of the admissions from these causes have been relatively mild cases. Finally, although the injury rate is higher for the WAC than for the rest of the Army, early in June almost half of the injuries to WAC personnel were treated in quarters, whereas only 10 percent of the injuries to men were so treated.

With increasing numbers of WAC personnel overseas, it is noteworthy that the health problems of the WAC overseas appear to be similar to those in the United States. A recent report from the 8th Air Force states in part:

"A preliminary study of the WAC hospital and quarters admissions indicated that the major illness was common respiratory disease. A disproportionately great number of respiratory admissions were confined to WAC personnel who had been in the theater for less than a month. Other major contributing causes to noneffectiveness were diarrheal diseases, gynecologic disorders, feet disorders and injuries."

## ADMISSIONS PER 1,000 STRENGTH PER YEAR, APRIL THROUGH JULY 1944

Cause of Admission	WAC	Total Army	Cause of Admission	WAC	Total Army
All Causes	973	585	Colds and Influenza	176	105
Disease	892	515	Neuropsychiatric	39.6	30.3*
Injury	81	70	Diarrhea and dysentery	21.5	9.5
			Measles, mumps, scarlet fever	7.3	11.7
			Pneumonia	5.7	9.6

\* Based on data for April through June 1944 only

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