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SHIPBOARD AND GROUND TROOP CASUALTY RATES AMONG NAVY AND
MARINE CORPS PERSONNEL DURING WORLD WAR II OPERATIONS



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SUMMARY

Problem

Medical resource planning requires projections of the rate of casualties anticipated during military operations. Projection of the numbers of wounded and killed has important implications for medical staffing and supplies as well as overall manpower policy planning.

Objective

The present investigation seeks to determine the rates of casualties aboard ships participating in World War II operations as well as Marine assault forces involved in the capture of Western Pacific islands.

Approach

Afloat casualty rates were computed using Bureau of Personnel casualty lists in conjunction with records detailing ships and dates of ship involvement in various World War II operations. Shore-based rates were calculated using data from various sources including the History of U.S. Marine Corps Operations in World War II. Casualty rates were computed per 1000 men per day.

Results

The rate of shipboard casualties in the Asiatic-Pacific theater across all operations was 0.56, while the rate in the European theater was 0.84. Individual operation rates ranged from 0.01 to 50.50. Among Pacific afloat operations there were 115 men wounded for every 100 killed. Eight of the 117 ship types had KIA rates more than double their WIA rates; among these only submarines and oilers involved more than ten vessels. Ground assault force rates averaged 15 times higher than ship-based rates. The highest rates for both afloat and ashore operations were seen for brief engagements occurring early in the war.

Conclusions

Among shipboard casualties, a full 48% were either 'missing in action' or killed outright and therefore would never reach medical facilities. In contrast, 76% of of ground casualties were wounded and would tax the medical resource system. The types and anatomical regions of wounds aboard ships are presently being investigated to better assess the medical requirements.

**SHIPBOARD AND GROUND TROOP CASUALTY RATES AMONG NAVY
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Introduction

Determination of casualty rates from past conflicts will allow projections to be made concerning the battle injuries and medical resource needs in future combat scenarios. The Department of Defense has undertaken a quad-service initiative designed to project, and make readily deployable, the equipment and supplies needed to establish treatment facilities within operational theaters. Deployable Medical Systems (DEPMEDS) is a modular system which involves the repositioning of medical materiel using data on the expected injuries and illnesses¹. Recent investigations have sought to determine the disease and non-battle injury (DNBI) rates for various geographical regions^{2,3,4,5} and to project the DNBI rates in times of conflict⁶. Though rates of illness incidence may exceed rates of wounded-in-action,^{7,8} the supplies and level of expertise required to treat battle injuries clearly places the greatest demands on medical facilities in times of war. Projections of casualty rates may also be used to predict bed requirements and may have important implications for manpower planners.

It is impossible to predict under what conditions the next military conflict with U.S. involvement will occur. The advent of the nuclear age seemed to make large scale conventional war less likely. In recent times, however, the easing of the Cold War and the push for nuclear disarmament has reduced the probability that strategic or even tactical nuclear weapons will be used. Though recent military operations have been brief interventions such as those in Grenada and Panama, it is the projection of rates of wounded-in-action (WIA) and killed-in-action (KIA) over prolonged military conflicts that is most useful to medical resource planning. For short-term small scale military actions, the need to reposition medical supplies and combat care specialists is not as critical as during extended conflicts where

air superiority may be difficult to maintain and where evacuation to CONUS treatment facilities may take days or weeks. It is during these latter types of operations that the deployment of adequately trained health care personnel and supplies is essential to the saving of numerous lives and the success of the operation. Indeed, as Smith points out, the lack of medical readiness could portend the "loss of the next war on the operating table"⁹.

The objective of the present investigation is to determine the casualty rates during the last major conflict in which both afloat and ground operations played major roles. The focus, then, will be on determining the killed-in-action and wounded-in-action rates during specific operations during World War II. Casualty incidence will be calculated for forces afloat as well as combat troops to provide medical logisticians with rates needed to better prepare for the medical requirements of a future conflict.

Method

Navy afloat casualty rates were computed using servicemen on the Bureau of Personnel casualty lists kept at the Operational Archives division of the Navy Historical Center in Washington, D.C. Each casualty, listed as WIA, KIA, DOW (Died of Wounds), or MIA (Missing-in-Action), is accompanied by data specifying the ship to which that individual was attached, the operation or engagement in which that vessel was involved at the time of the casualty, and the date of the casualty incident. Also archived at the Navy Historical Center is a list of all afloat combat operations/engagements and a record of the ships involved in each operation as well as the dates of their involvement. To determine ship populations, crew complements aboard one thousand sunk or damaged vessels were collected from the Navy muster rolls housed at the National Archives in Washington, D.C. Strengths for ships not collected at the National Archives were determined from the Dictionary of American Naval Fighting Ships.¹⁰

Shore-based casualty rates for Marine and Naval forces were computed largely on the basis of data tabled in the History of U.S. Marine Corps Operations in World War II.¹¹⁻¹³ These tables provided

overall WIA and KIA frequencies for specific operations while data detailing the daily tallies of casualties as well as the strengths of the Marine units over the course of the operation were found in narratives in a number of historical accounts.¹¹⁻¹⁶ Rates are provided for assaults on various Western Pacific islands. For rate calculation purposes, the operations were considered over when that region was deemed secure even though some troops may have continued to maintain a presence. Navy ashore casualties were almost exclusively the physicians and hospital corpsmen attached to Marine units.

In both the afloat and ashore phases of this study, unless otherwise specified, the KIA rate includes those personnel killed outright, those that died of wounds, and those missing in action. The Navy defines DOW as those casualties that died as a result of their wounds subsequent to the day on which wounded¹⁷ and the MIA category includes those later determined dead or presumed dead by virtue of their absence for more than a year. Casualty incidence is calculated as a rate per 1000 strength per day. Shipboard casualty rates are computed by type of vessel as well as by operation. Shore-based rates are calculated by overall operation, and where possible, in smaller chronological increments.

Analyses

Forces Afloat

There were 5780 vessels encompassing 117 different types of ships involved in World War II operations and engagements. The ten most prevalent ship types were: LCT (landing craft tank) n=818; LST (tank landing ships) n=759; LCI (landing craft infantry) n=617; DD (destroyers) n=417; YMS (auxiliary motor mine sweepers) n=272; LSM (medium landing ships) n=251; DE (escort snips) n=243; SS (submarines) n=235; PT (motor torpedo boats) n=213; and APA (attack transport) n=176. Among major combatants other than the aforementioned destroyers, there were 25 battleships (BB), 8 protected cruisers (C), 25 heavy cruisers (CA), 47 light cruisers (CL), 22 aircraft carriers (CV), 62 escort aircraft carriers (CVE), and 9 small aircraft carriers (CVL) participating in afloat operations.

Appendix A lists all World War II operations and engagements, the codes used to define them on the Bureau of Personnel casualty rolls, the dates of each operation, the total number of days, and the number of ships involved in each operation. This listing indicates that each of the following required the use of more than one thousand vessels: Okinawa Gunto operation, the Leyte operation, the Luzon operation, the Marianas operation, the Iwo Jima operation, and the Western New Guinea operation. Appendix B supplements the information in the first appendix by providing the numbers and specific types of ships involved in mounting each operation. This appendix indicates the wide range of ships (major combatants, patrol craft, submarines, mincraft, landing craft, auxiliary vessels) critical to successful naval engagements.

Figure 1 is a graphic presentation of the casualty rates for the Asian and European theaters as well as the rates for Pacific Ocean submarine patrols and the total of all sea-based operations. The total shipboard casualty rates per 1000 strength per day for Asia, Europe, Pacific submarine patrols, and all sea operations were 0.56, 0.84, 1.33, and 0.60 respectively. Table 1 is a display of the WIA rates, KIA rates, and total casualty rates for all of the various operations and engagements in which the U.S. Navy participated in World War II.

The overall operation casualty rates in the Asiatic-Pacific theater ranged from a low of 0.01 (Hollandia) to a high of 50.50 (Tassafaronga). Total casualty rates aboard ships at Pearl Harbor were even higher, but the attack can not be considered a true mounted operation. Of the six previously mentioned operations requiring more than one thousand ships, Luzon had the highest casualty rate (1.77) followed by Leyte (1.34), Okinawa Gunto (0.42), Iwo Jima (0.37), Western New Guinea (0.17), and the Marianas (0.10).

Although the WIA:KIA ratio across all Asia-Pacific operations was 1.15:1 (115 men wounded for every 100 killed), the largest operations had ratios ranging from 1.55:1 (Okinawa Gunto) to 4.00:1 (Marianas). A number of operations had KIA rates which exceeded their WIA rates; those operations which had a WIA:KIA ratio less than 1.0 included the Philippine Islands operation (0.17:1), Coral Sea (0.24:1), Guadalcanal Third Savo (0.41:1), Guadalcanal-Tulagi landings (0.57:1), capture and defense of Guadalcanal (0.68:1), New Georgia Group (0.74:1), Gilbert

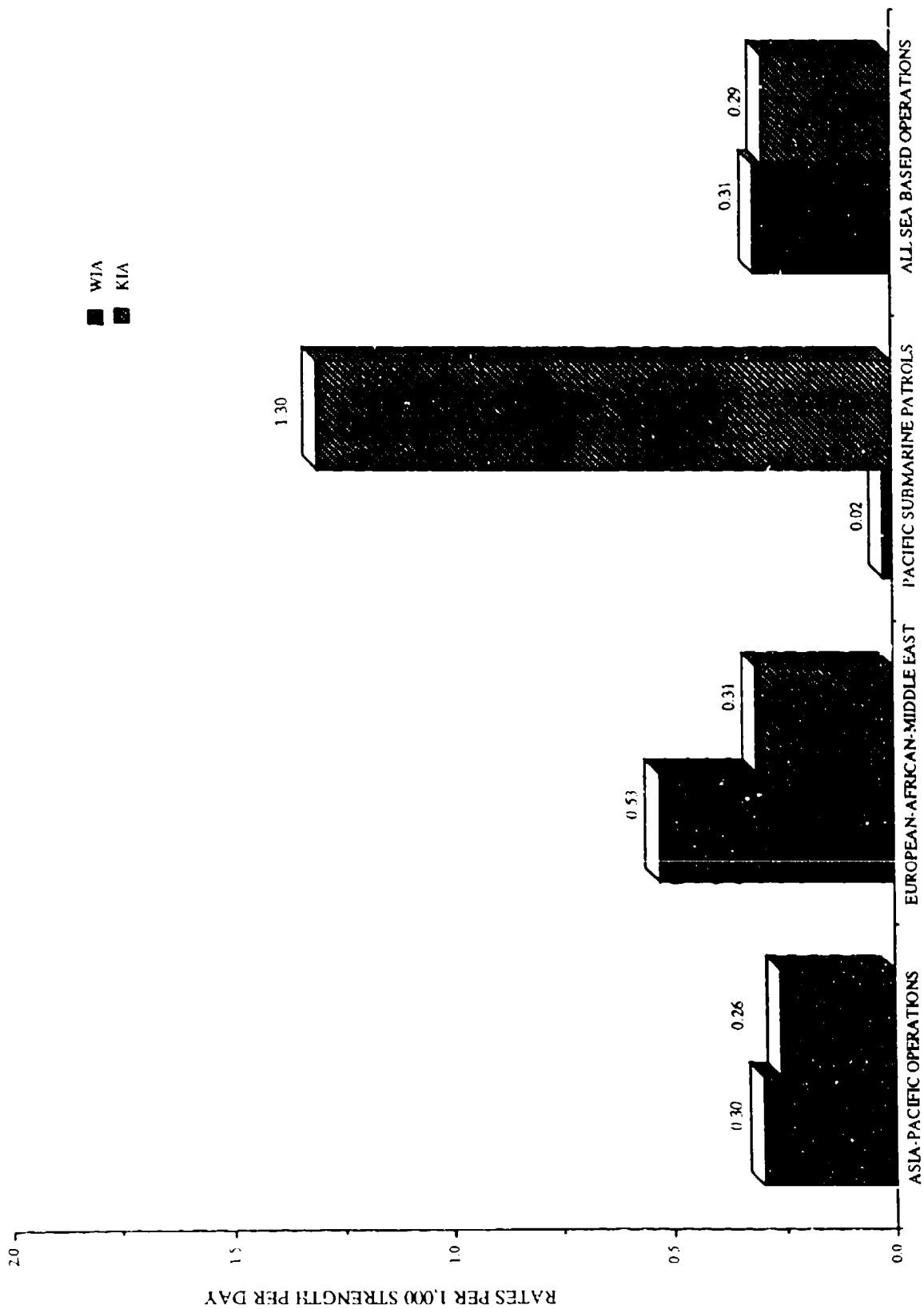


Fig. 1. Overall rates of shipboard casualties by theater of operation during WWII.

Islands Operation (0.75:1) Rennel Island (0.78:1), and Cape Esperance (0.80:1).

Ship operations in the Europe-Africa-Middle East theater yielded a WIA rate that was 76% higher than in the Pacific and a KIA rate which was 19% higher. The operations in this theater with the highest casualty rates per thousand strength were the Salerno landings (2.18), Sicilian occupation (1.78), Invasion of Normandy (1.58), and West Coast of Italy operations (1.40). Only the Salerno landings operation had more killed than wounded (WIA:KIA=0.55:1).

Table 2 breaks the killed classification into its constituent parts (died of wounds, missing in action, killed in action) and displays the percentages of the total casualties which were WIA, DOW, MIA and KIA by each operation. Overall, 49.6% of casualties were wounded, 2.5% casualties died of their wounds, 21.5% of casualties were missing in action, and 26.4% of casualties were killed outright.

Casualty rates by ship type among vessels engaged in combat operations during World War II are shown in Table 3. The vessels with rates twice the mean, or greater than 1.20 per 1000 per day, were patrol craft (YP) 11.83, ocean tug old (ATO) 9.00, patrol gunboat (PG) 7.73, patrol vessel-yacht (PY) 7.36, fuel oil barge (YO) 5.22, landing craft infantry (LCFF) 3.65, mine layer (CM) 3.62, ocean tug (AT) 2.64, submarine (SS) 1.89, harbor tug (YT) 1.81, heavy cruiser (CA) 1.68, and high speed minelayer (DMS) 1.49. Of these, only five ship types included more than ten vessels: submarines (n=235) high speed minelayers (n=39), heavy cruisers (n=25), patrol craft (n=13), and landing craft infantry (n=11).

There were eight ship types which had KIA rates which were at least twice as high as their WIA rate: patrol vessel-yacht (PY), patrol gunboat (PG), submarine (SS), fuel oil barge (YO), seaplane tender-destroyer (AVD), miscellaneous-auxiliary (AG), oiler (AO), and seaplane tender (AV). Among the ship types in which the KIA rates were at least double the WIA rates, only submarines (n=235) and oilers (n=64) involved more than ten vessels.

Table 4 displays the frequencies and percentages of the total casualties aboard each type of ship which were wounded, wounded and later died, missing and presumed or determined dead, and killed-in-

action. Destroyers, by a large margin, had the most casualties on board (14,386) followed by submarines (6184), heavy cruisers (4919), carriers (4832), battleships (3859), light cruisers (3664), tank landing ships (3313), and escort aircraft carriers (3015). Destroyers also had the highest number of WIA, DOW, and KIA while submarines had the largest frequency of missing-in-action.

Forces Ashore

Combat casualty rates were computed for nine Pacific ground operations involving U.S. Marines and Navy support troops: Tarawa, Kwajalein, Eniwetok, Saipan, Tinian, Peleliu, Iwo Jima, Okinawa, and Guam. The overall Marine casualty (wounded plus killed) rates per 1000 strength per day for each operation were Tarawa: 80.55; Kwajalein: 23.84; Eniwetok: 25.58; Saipan: 15.12; Tinian: 11.70; Peleliu: 11.68; Iwo Jima: 12.74; Okinawa: 3.71; and Guam: 8.57. Casualty rates broken into their WIA and KIA components are presented in graph form for Marines in Figure 2 and Navy in Figure 3; the operations are presented in the chronological sequence in which they occurred.

Examining casualty rates for an entire operation can be misleading because during the course of the operation rates may fluctuate substantially depending on its length and the activities engaged in (initial attack, pursuit, mopping up). Figure 4 is a display of the casualty rates incurred on the first day of each operation. Overall casualty rates on the initial day of the assault ranged from a high of 100.0 at Saipan to a low of 1.77 at Okinawa.

Figures 5-9 are line graphs of Marine casualty rates plotted at various points during the course of the operations. It can be seen that there are precipitous drops in both WIA and KIA rates after the first day in all but the Okinawa operation.

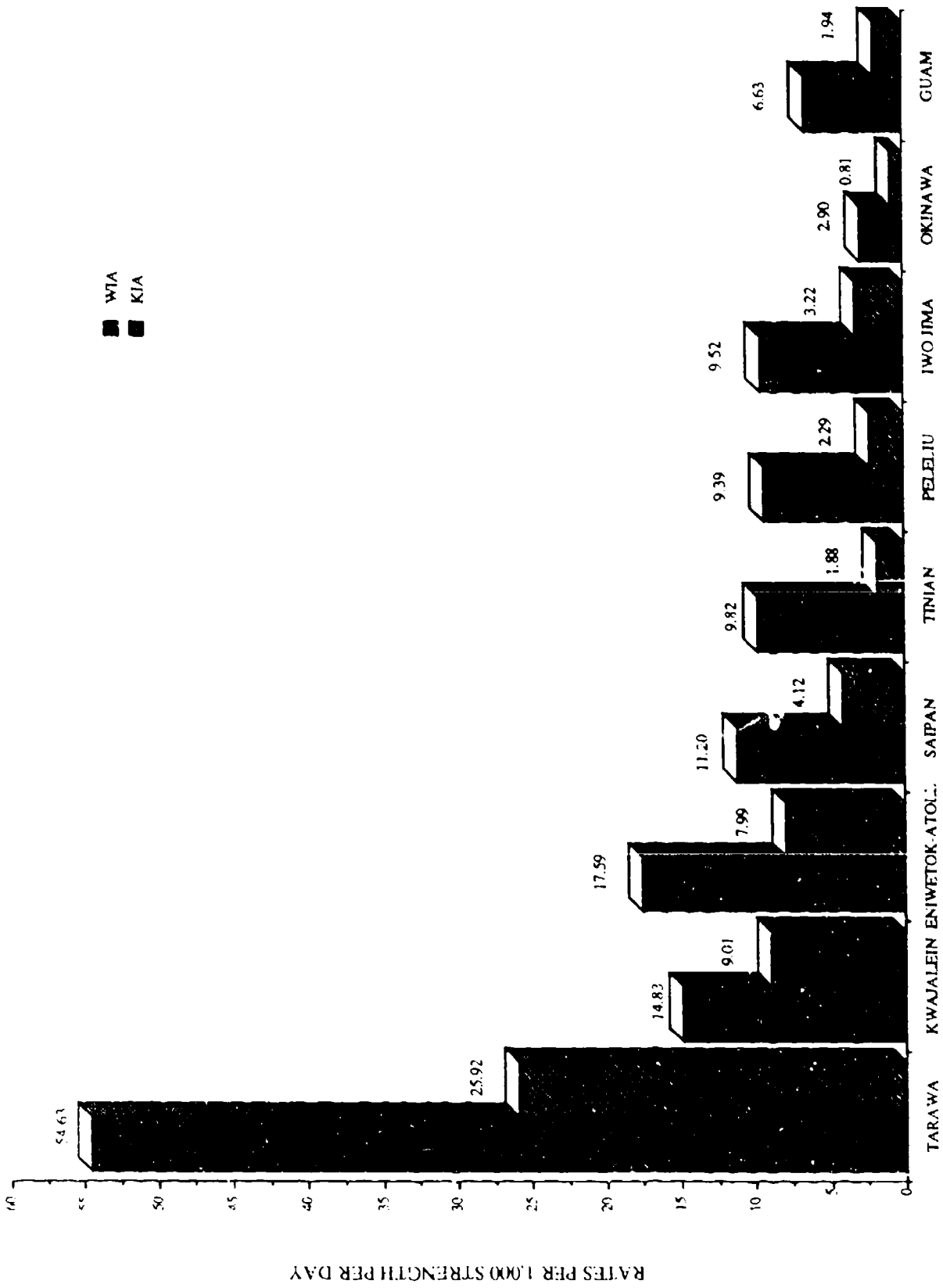


Fig. 2. Marine Corps casualty rates during World War II operations.

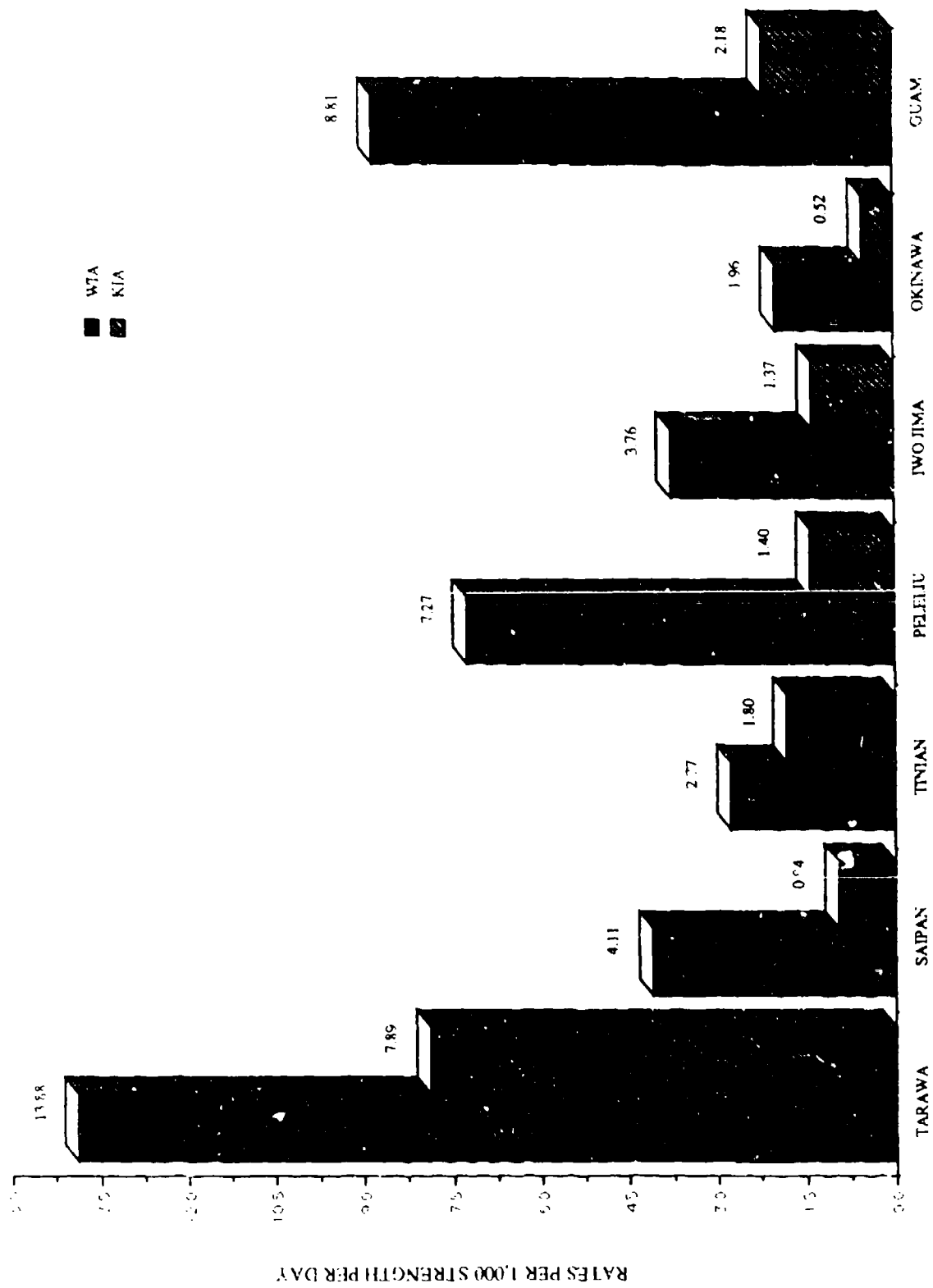


Fig. 3. Navy Casualty rates during World War II operations.

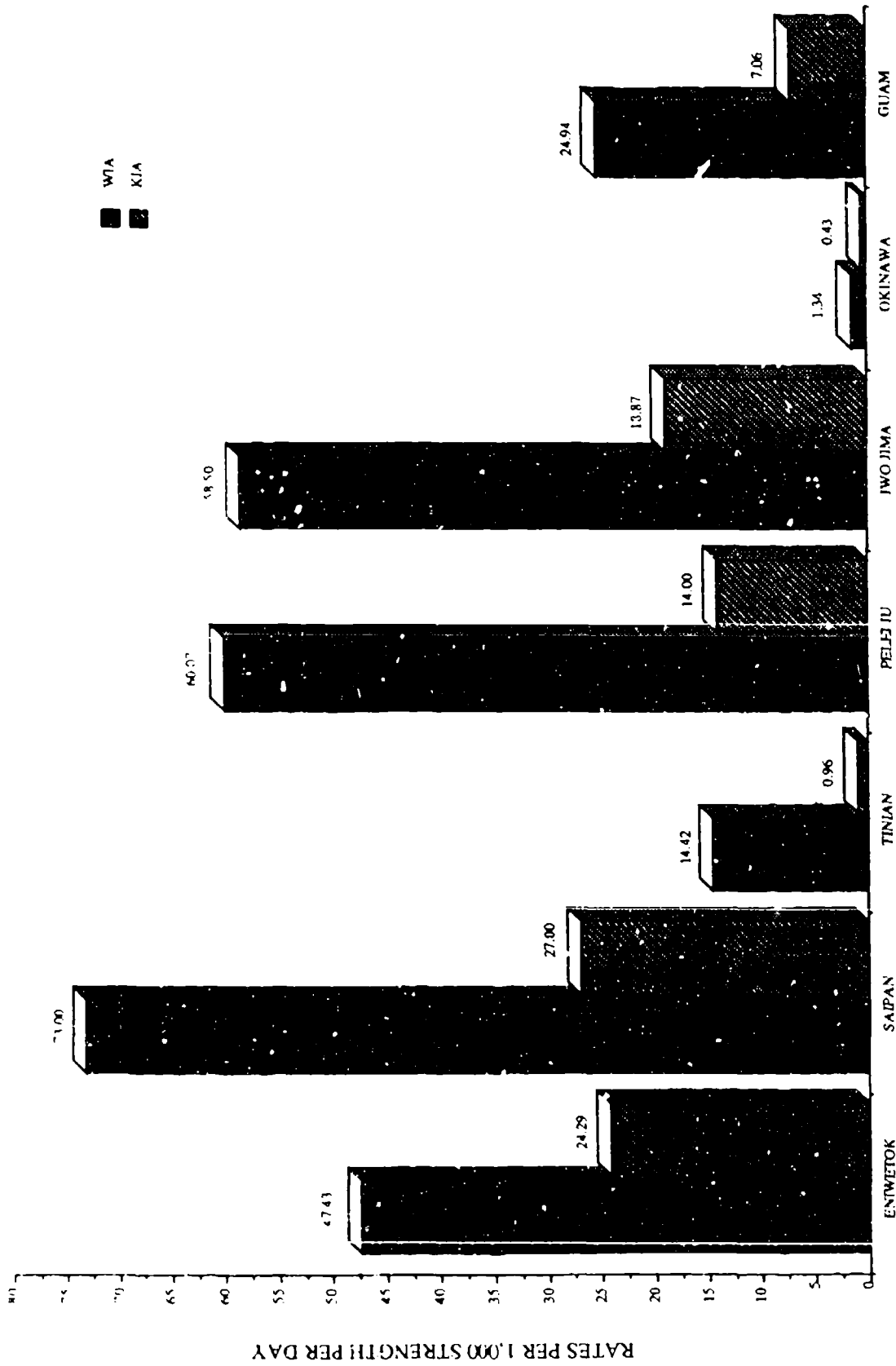


Fig. 4. Marine Corps casualty rates on first day of World War II operations.

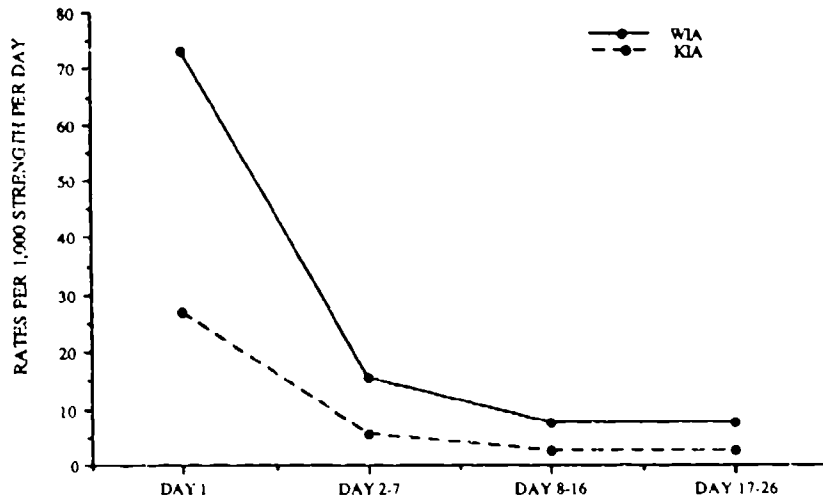


Fig. 5. Marine casualty rates during the capture of Saipan; June 15 - July 10, 1944.

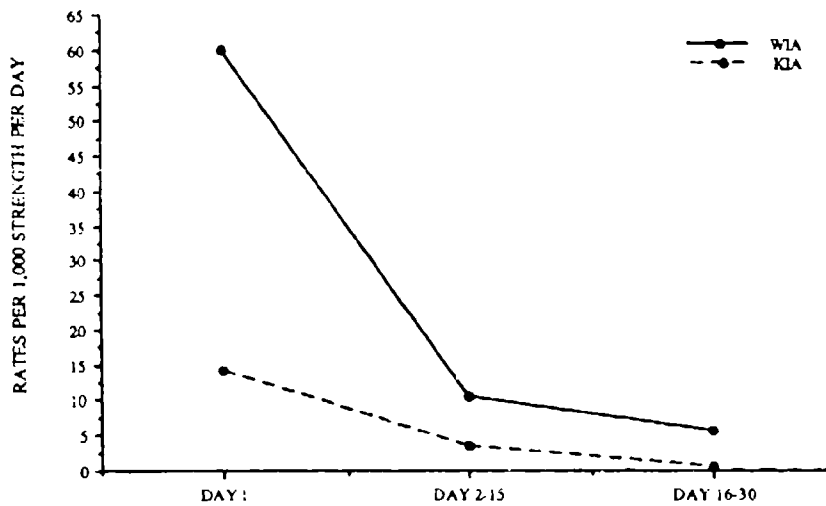


Fig. 6. Marine casualty rates during the capture of Peleliu; Sept 15 - Oct 14, 1944.

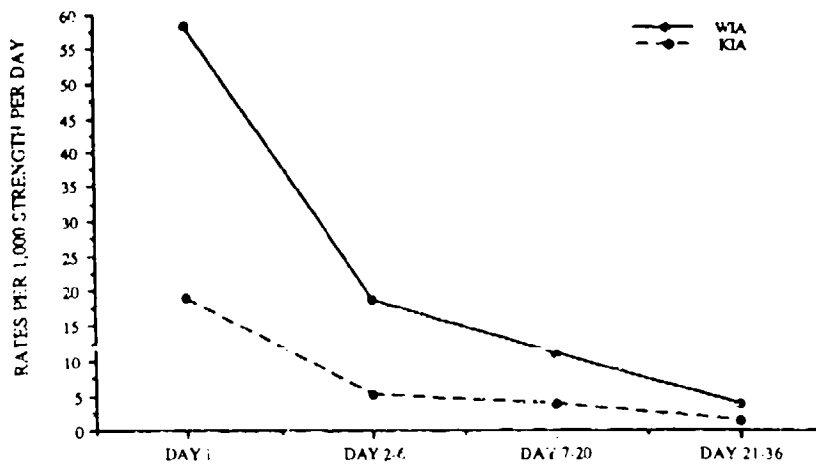


Fig. 7. Marine casualty rates during the capture of Iwo Jima; Feb 19 - March 26, 1945.

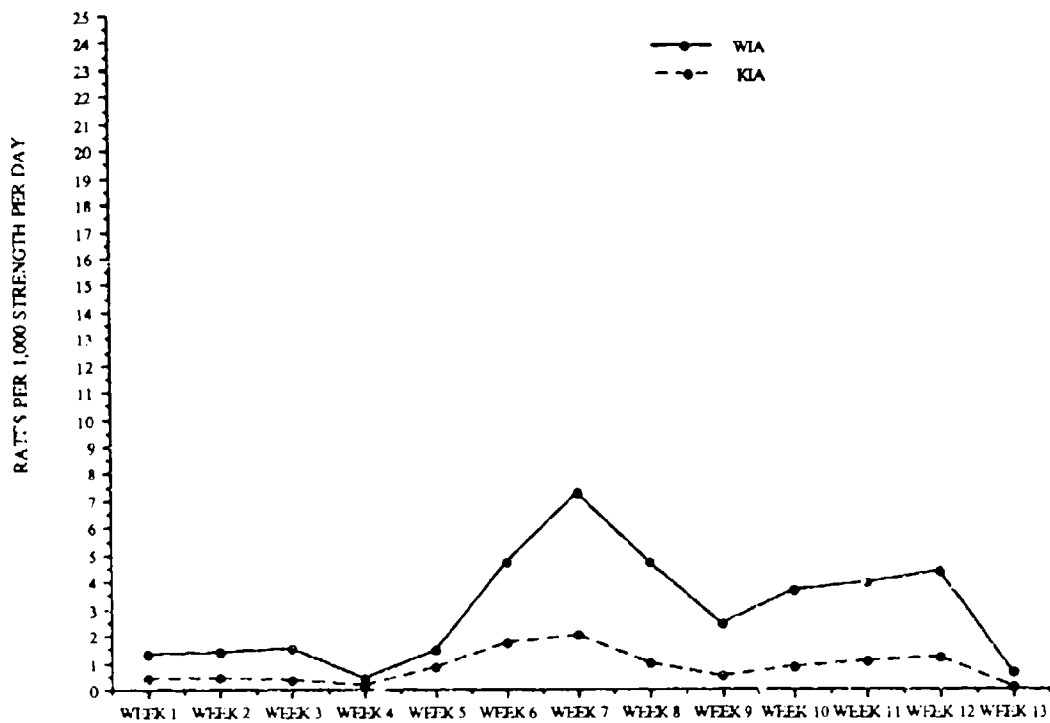


Fig. 8. Marine casualty rates during the capture of Okinawa; Apr 1 - June 30, 1945.

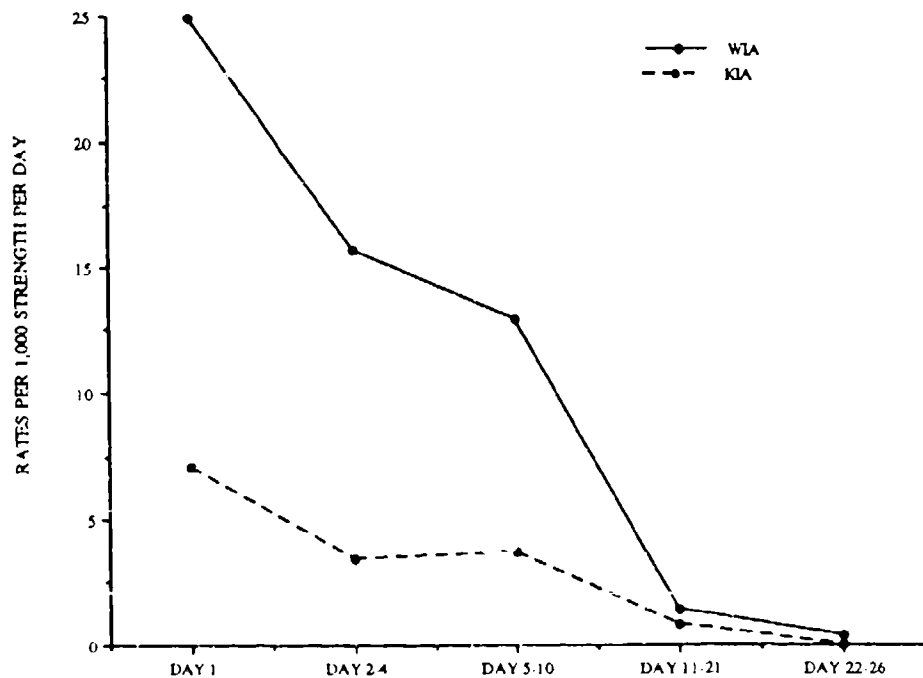


Fig. 9. Marine casualty rates during the capture of Guam; July 21 - Aug 15, 1945.

Discussion

There were large variations in afloat and ashore casualty rates depending on the time and place of the operations. Ship-based and ground troop casualty rates during WWII operations were highest in brief operations early in the war and lowest in the operations which extended over weeks and occurred late in the conflict.

Examples of sea operations with high rates, which occurred in 1942, include the Guadalcanal-Tulagi landings (18.18 casualties per 1000 strength per day), Santa Cruz Islands (32.28), and Tassafaronga (50.50) and lasted three, one, and two days respectively. In contrast, the Iwo Jima operation had a casualty rate of 0.37 and the Okinawa Gunto operation rate of casualties was 0.42. The latter two operations took place during 1945 and extended one and three months, respectively. Though actual numbers of casualties were much higher in the extended engagements than in the brief operations, there was as much as a fifty-fold decrease in daily rates of casualties.

Among ground operations examined, again the highest casualty rates were those occurring earlier in time and of short duration. The Tarawa operation (Battle for Bettio) was the most devastating with a rate of over 80 men per 1000 per day; rates of killed and wounded were also at high levels at Northern Kwajalein (23.84) and the Eniwetok atoll (25.58). These assaults lasted four days, three days, and seven days and took place between November 1943 and February 1944. In comparison, the captures of Okinawa and Guam in mid-1945 had rates of 3.71 and 8.57, and had operational durations of 90 days and 26 days.

Of the ten Pacific afloat operations with more KIA than WIA all but Rennel Island, New Georgia, and Gilbert Islands occurred in the first year of the war and these three took place in the second year. The two operations with KIA rates quadruple the WIA rates were the Philippine Island and Coral Sea operations, both of which occurred in the first six months of U.S. involvement.

Specific ship types with the high casualty rates included tugs, minecraft, and patrol craft. These vessels are generally small, with minimal crew complements, yielding high rates of casualties when hit. Fuel oil barges, landing craft infantry (gunboat), and submarines also

had high rates of casualties. Oil barges and landing craft probably owe their elevated rate of casualties to the functions they were performing. Barges were prime targets because they provided the lifeblood to the forces afloat while the combustibility of this fuel ensured casualties; the smaller landing craft would be expected to come under heavy attack the closer they come to shore with their assault forces. Rate of casualties aboard submarines are notable not only because they are high but also because less than 20% of the casualty total represented wounded personnel. There were over 200 submarines involved in the war effort and they played a critical role in locating and destroying other vessels; when targeted by the enemy, submarines were often sunk with few or no survivors.

The casualty rates of Marine assault forces involved in the capture of Pacific islands, not surprisingly, were much higher than those evidenced among the forces afloat. Even with the preparatory bombardments that took place in the days or weeks preceding the landing of troops, the Japanese usually mustered formidable opposition to the first waves of U.S. troops coming ashore. The terrain of these islands offered the enemy safe haven from naval gunfire and aerial strafing within the many caves as well as providing natural machine gun positions to face U.S. assault forces. Consequently, casualty rates were particularly high on the day of the invasion in most operations, but especially so at the "Battle for Betio" on Tarawa, where over a quarter of the landing force were wounded or killed on D-Day, and Saipan, where the forces were decimated on the day of the initial assault.

Typically, after the the first waves of troops were ashore and firmly entrenched the ensuing days saw casualty rates decrease dramatically. In the week that followed the initial landings, rates dropped at least 70 percent for the operations at Eniwetok, Saipan, Tarawa, and Iwo Jima. Operations at Guam, Peleliu, and Iwo Jima all lasted four to five weeks and though scattered pockets of resistance were found throughout the islands casualty rates were but a fraction of their original levels during the final stages of pursuit and mop up. The battle of Okinawa, an operation lasting a full three months,

yielded a different casualty pattern than the other extended engagements. Large fluctuations in casualty rates were not evidenced in the Okinawa operation; low rates were observed in the first weeks with the highest rates seen between weeks six and eight and then a tapering off by the final weeks to their original low levels. This casualty scenario resulted from low levels of opposition to the landings combined with enemy forces firmly dug in at several locations on the island.¹⁴

Conclusions

While considerable variation was seen in the casualty rates within both afloat operations and ashore operations, there was a vast difference in the magnitude of the rates between shipboard and landing force rates. Casualties aboard ships were sustained at an overall rate of 0.56 per 1000 men per day during Pacific operations. This contrasted with an overall Marine assault force rate of 8.48 for the nine Pacific island operations examined in this study. Further, though WIA and KIA rates were comparable for shipboard operations (0.30 vs. 0.26) the difference among ground troops was much greater (6.42 vs. 2.05). Aboard ships during WWII a crewmember was almost as likely to be killed as wounded, whereas in Pacific ground operations the probability was three times greater of being wounded than killed.

The goal of the present effort was to compute casualty rates for a previous wartime scenario in that it might reflect some light on the medical resource needs in a future conflict. Projected rates of disease will likewise need to be factored in to the required medical resources and these efforts are presently underway.⁶ Finally, when gauging medical requirements it is important to project not only the number of wounded but the types of injuries as well. Type and anatomical location of injuries are currently being examined in conjunction with weapon of attack and type of vessel among U.S. warships sunk or damaged during World War II. Though no two conflicts will be identical, estimates of the numbers and types of potential casualties should aid in the projection of needed resources.

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TABLE 1. RATES OF SHIPBOARD CASUALTIES DURING WORLD WAR II OPERATIONS

<u>ASIATIC-PACIFIC AREA</u>				
<u>OPERATION</u>	<u>CODE</u>	<u>WIA RATE</u> *	<u>KIA RATE</u>	<u>TOTAL CASUALTY RATE</u>
PEARL HARBOR-MIDWAY	P1	20.40	51.94	72.34
PHILIPPINE ISLANDS OPERATION	P3	0.44	2.56	3.00
NETHERLANDS EAST INDIES	P4	0.92	0.15	1.07
MAKAMAR STRAIT	P4-1	2.15	0.00	2.15
BADOENG STRAIT	P4-2	1.64	0.55	2.19
JAVA SEA	P4-3	0.00	0.00	0.00
PACIFIC RAIDS-1942	P5	0.62	0.16	0.79
CORAL SEA	P6	2.17	8.90	11.07
MIDWAY	P7	1.81	1.71	3.52
GUADALCANAL-TULAGI LANDINGS	P8	6.63	11.55	18.18
CAPTURE/DEFENSE OF GUADALCANAL	P9	0.48	0.70	1.18
EASTERN SOLOMONS	P11	2.04	2.04	4.07
CAPE ESPERANCE	P13	13.82	17.24	31.06
SANTA CRUZ ISLANDS	P14	18.77	13.51	32.28
GUADALCANAL (3d SAVO)	P15	8.84	21.34	30.17
TASSAFARONGA (4th SAVO)	P16	14.06	36.44	50.50
EASTERN NEW GUINEA OPERATION	P17	0.10	0.06	0.16
RENNEL ISLAND	P18	2.25	2.90	5.15
CONSOLIDATION SOLOMON ISLANDS	P19	0.13	0.05	0.18
CONSOLIDATION OF SO. SOLOMONS	P19-1	0.27	0.12	0.39
CONSOLIDATION OF NO. SOLOMONS	P19-2	0.01	0.00	0.01

* Rates are per 1,000 strength per day.

<u>OPERATION</u>	<u>CODE</u>	<u>WIA RATE</u>	<u>KIA RATE</u>	<u>TOTAL CASUALTY RATE</u>
ALEUTIANS OPERATION	P20	0.07	0.02	0.09
KOMANDORSKI ISLAND	P20-1	10.20	3.11	13.31
ATTU OCCUPATION	P20-2	0.01	0.01	0.02
NEW GEORGIA GROUP OPERATION	P21	1.28	1.72	3.01
NEW GEORGIA-REDOVA-VANGUNU	P21-1	0.62	0.70	1.32
KULA GULF ACTION	P21-2	8.99	25.40	34.39
KOLOMBANGARA ACTION	P21-3	2.32	5.32	7.64
VELLA GULF ACTION	P21-4	0.38	0.00	0.38
VELLA LAVELLA OCCUPATION	P21-5	0.75	0.27	1.02
ACTION OFF VELLA LAVELLA	P21-6	38.94	65.95	104.90
BISMARCK ARCHIPELAGO OPERATION	P22	0.29	0.24	0.52
PACIFIC RAIDS-1943	P23	0.06	0.01	0.07
TREASURY-BOUGAINVILLE OPER.	P24	0.53	0.32	0.85
GILBERT ISLANDS OPERATION	P25	0.24	0.32	0.56
MARSHALL ISLANDS OPERATION	P26	0.08	0.02	0.10
ASIATIC-PACIFIC RAIDS-1944	P27	0.17	0.03	0.20
WESTERN NEW GUINEA OPERATION	P28	0.12	0.05	0.17
MARIANAS OPERATION	P29	0.08	0.02	0.10
WESTERN CAROLINE ISLANDS OPER.	P30	0.02	0.01	0.03
LEYTE OPERATION	P31	0.84	0.49	1.34
LEYTE LANDINGS	P31-1	0.39	0.17	0.56
BATTLE OF SURIGAN STRAIT	P31-2	0.03	0.00	0.03
3d FLEET SUPPORTING OKINAWA	P31-3	0.02	0.00	0.02
NO. LUZON/FORMOSA ATTACKS	P31-4	0.49	0.20	0.69
LUZON ATTACKS	P31-5	0.26	0.13	0.39
VISAYAS ATTACKS	P31-6	0.02	0.00	0.02
ORMOC BAY LANDINGS	P31-7	7.97	4.33	12.30
BATTLE OF CAPE ENGANO	P31-9	160.08	89.78	249.87
LUZON OPERATION	P32	1.25	0.52	1.77
MINDORO LANDINGS	P32-1	2.27	0.90	3.17
LINGAYEN GULF LANDING	P32-2	1.28	0.42	1.70
3d FLEET-LUZON ATTACKS	P32-3	0.06	0.03	0.08
FORMOSA ATTACKS	P32-4	0.76	0.44	1.20
CHINA COAST ATTACKS	P32-5	0.02	0.01	0.02
NANSEL SHOTO ATTACK	P32-6	0.00	0.00	0.00

<u>OPERATION</u>	<u>CODE</u>	<u>WIA RATE</u>	<u>KIA RATE</u>	<u>TOTAL CASUALTY RATE</u>
IWO JIMA OPERATION	P33	0.23	0.13	0.37
ASSAULT OCCUPATION IWO JIMA	P33-1	0.26	0.15	0.41
5TH FLEET RAIDS HONSHU/ NANSEL SHOTO	P33-2	0.00	0.00	0.00
BOMBARDMENTS OF IWO JIMA	P33-3	0.23	0.13	0.37
OKINAWA GUNTO OPERATION	P34	0.25	0.16	0.42
ASSAULT/OCCUPATION	P34-1	0.31	0.18	0.48
5TH & 3d FLEET RAIDS	P34-2	0.14	0.13	0.26
3d FLEET OPER. AGAINST JAPAN	P35	0.08	0.06	0.14
KURILE ISLANDS OPERATION	P36	0.02	0.00	0.02
BORNEO OPERATIONS	P37	0.24	0.04	0.28
TARAKAN ISLAND OPERATION	P37-1	0.19	0.07	0.26
BRUNEI BAY OPERATIONS	P37-2	0.15	0.07	0.22
BALIKPAPAN OPERATIONS	P37-3	0.20	0.02	0.22
TINIAN CAPTURE	P38	0.62	0.16	0.77
CONSOLIDATION SO. PHILIPPINES	P39	0.15	0.05	0.20
MANILA BAY-BICOL OPERATIONS	P41	0.59	0.33	0.92
MINESWEEPING OPER. PACIFIC	P207	0.02	0.02	0.04
OVERALL ASIA-PACIFIC OPER.		0.30	0.26	0.56

PACIFIC SUBMARINE PATROLS

<u>OPERATION</u>	<u>CODE</u>	<u>WIA RATE</u>	<u>KIA RATE</u>	<u>TOTAL CASUALTY RATE</u>
SUBMARINE PATROLS	P208	0.02	1.30	1.33

EUROPEAN-AFRICAN-MIDDLE EASTERN AREA

<u>OPERATION</u>	<u>CODE</u>	<u>WIA RATE</u>	<u>KIA RATE</u>	<u>TOTAL CASUALTY RATE</u>
NORTH AFRICAN OCCUPATION	E1	0.34	0.21	0.55
ALGERIA-MOROCCO LANDINGS	E1-1	0.83	0.82	1.65
ACTIONS OFF CASABLANCA	E1-2	3.30	0.00	3.30
TUNISIAN OPERATIONS	E1-3	0.06	0.02	0.08
SICILIAN OCCUPATION	E2	1.14	0.64	1.78
SALERNO LANDINGS	E3	0.77	1.41	2.18
WEST COAST OF ITALY OP-1944	E4	0.84	0.56	1.40
ANZIO NETTUNO ADV LANDINGS	E4-1	0.80	0.54	1.34
BOMBARDMENTS FORMIA-ANZIC	E4-2	0.01	0.00	0.01
ELBA AND PLANOSA LANDINGS	E4-3	6.45	1.17	7.62
INVASION OF NORMANDY	E5	1.11	0.46	1.58
INVASION OF SO. FRANCE	E7	0.11	0.02	0.13
OVERALL EURO-AFR-MIDDLE EAST. OP.		0.53	0.31	0.84
OVERALL WWII SEA-BASED OPERATIONS		0.31	0.29	0.60

TABLE 2. CASUALTY CATEGORY PERCENTAGES BY OPERATIONS DURING WORLD WAR II

ASLATIC-PACIFIC AREA

<u>OPERATION</u>	<u>CODE</u>	<u>PERCENT OF TOTAL CASUALTIES</u>			
		<u>WIA</u>	<u>DOW</u>	<u>MIA</u>	<u>KIA</u>
PEARL HARBOR-MIDWAY	P1	28.2	01.1	00.0	70.7
PHILIPPINE ISLANDS OPERATION	P3	14.6	00.3	75.3	09.8
CORAL SEA	P6	19.6	01.5	56.6	22.3
MIDWAY	P7	51.4	01.7	30.8	16.1
GUADALCANAL-TULAGI LANDINGS	P8	36.5	01.1	53.0	09.4
CAPTURE/DEFENSE OF GUADALCANAL	P9	40.8	01.3	50.8	07.1
EASTERN SOLOMONS	P11	50.0	00.0	00.7	49.3
CAPE ESPERANCE	P13	44.5	01.1	09.2	45.2
SANTA CRUZ ISLANDS	P14	58.1	03.0	11.9	27.0
GUADALCANAL (3D SAVO)	P15	29.3	01.4	23.1	46.2
TASSAFARONGA (4TH SAVO)	P16	27.8	02.4	32.0	37.8
EASTERN NEW GUINEA OPERATION	P17	63.8	05.8	09.2	21.3
RENNEL ISLAND	P18	43.6	01.3	40.3	14.8
CONSOLIDATION SOLOMON ISLANDS	P19	71.8	04.6	11.0	12.6
CONSOLIDATION OF SO. SOLOMONS	P19-1	68.7	04.4	10.6	16.3
CONSOLIDATION OF NO. SOLOMONS	P19-2	94.1	05.9	00.0	00.0
ALEUTIANS OPERATION	P20	74.4	10.2	00.0	15.4
KOMANDORSKI ISLAND	P20-1	76.7	06.7	00.0	16.7
ATU OCCUPATION	P20-2	57.1	28.6	00.0	14.3
NEW GEORGIA GROUP OPERATION	P21	42.5	02.5	46.4	08.6
NEW GEORGIA-RENOVA-VANGUNU	P21-1	47.1	02.6	41.9	08.4
KULA GULF ACTION	P21-2	26.1	00.8	72.7	00.4
KOLOBANGARA ACTION	P21-3	30.3	01.1	63.0	05.6
VELLA GULF ACTION	P21-4	100.0	00.0	00.0	00.0
VELLA LAVELLA OCCUPATION	P21-5	73.3	04.2	04.2	18.3
ACTION OFF VELLA LAVELLA	P21-6	37.1	06.0	43.7	13.2

PERCENT OF TOTAL CASUALTIES

<u>OPERATION</u>	<u>CODE</u>	<u>WIA</u>	<u>DOW</u>	<u>MIA</u>	<u>KIA</u>
BISMARCK ARCHIPELAGO OPERATION	P22	54.8	05.2	29.5	10.5
TREASURY-BOUGAINVILLE OPER.	P24	62.5	03.8	22.4	11.3
GILBERT ISLANDS OPERATION	P25	43.2	01.3	48.0	07.5
MARSHALL ISLANDS OPERATION	P26	76.1	02.3	08.5	13.1
ASIATIC-PACIFIC RAIDS-1944	P27	83.3	03.5	04.4	00.8
WESTERN NEW GUINEA OPERATION	P28	71.1	04.3	07.5	17.1
MARIANAS OPERATION	P29	84.1	05.0	01.6	09.2
WESTERN CAROLINE ISLANDS OPER.	P30	75.1	07.5	01.6	15.8
LEYTE OPERATION	P31	63.6	04.0	06.1	26.3
LEYTE LANDINGS	P31-1	70.1	04.4	02.4	23.1
BATTLE OF SURIGAN STRAIT	P31-2	87.5	12.5	00.0	00.0
3D FLEET SUPPORTING OKINAWA	P31-3	100.0	00.0	00.0	00.0
NO. LUZON/FORMOSA ATTACKS	P31-4	71.2	03.8	00.0	25.0
LUZON ATTACKS	P31-5	66.4	04.2	02.4	27.0
VJ AYAS ATTACKS	P31-6	100.0	00.0	00.0	00.0
ORmoc BAY LANDINGS	P31-7	64.8	06.0	03.8	25.4
BATTLE OF CAPE ENGANO	P31-9	64.1	01.8	00.1	34.0
LUZON OPERATION	P32	70.4	04.1	00.5	25.0
MINDORO LANDINGS	P32-1	71.8	07.3	00.6	20.3
LINGAYEN GULF LANDING	P32-2	75.3	04.5	00.2	20.0
3D FLEET-LUZON ATTACKS	P32-3	66.7	06.7	00.0	26.6
FORMOSA ATTACKS	P32-4	63.4	01.9	00.0	34.7
CHINA COAST ATTACKS	P32-5	75.0	00.0	00.0	25.0
IWO JIMA OPERATION	P33	63.6	02.5	00.5	33.4
ASSAULT OCCUPATION IWO JIMA	P33-1	63.3	02.3	00.5	33.9
5TH FLEET RAIDS HONSHU/ NANSEL SHOTO	P33-2	100.0	00.0	00.0	00.0
BOMBARDMENTS OF IWO JIMA	P33-3	63.6	00.0	00.0	36.4
OKINAWA GUNTO OPERATIONS	P34	60.9	03.0	02.0	34.1
ASSAULT/OCCUPATION	P34-1	63.5	03.3	02.6	30.6
5TH & 3D FLEET RAIDS	P34-2	51.7	01.8	00.1	46.4
3D FLEET OPER. AGAINST JAPAN	P35	57.1	02.4	01.5	39.0
BORNEO OPERATIONS	P37	85.6	01.0	02.8	10.6
TARAKAN ISLAND OPERATION	P37-1	74.2	03.2	16.1	06.5
BRUNEI BAY OPERATIONS	P37-2	69.0	00.0	00.0	31.0
BALIKPAPAN OPERATIONS	P37-3	89.7	01.1	00.0	09.2

PERCENT OF TOTAL CASUALTIES

<u>OPERATION</u>	<u>CODE</u>	<u>WIA</u>	<u>DOW</u>	<u>MIA</u>	<u>KIA</u>
TINIAN CAPTURE	P38	79.5	07.9	01.3	11.3
CONSOLIDATION SO. PHILIPPINES	P39	76.0	01.1	00.0	22.9
HOLLANDIA OPERATION	P40	100.0	00.0	00.0	00.0
MANILA BAY-BICOL OPERATIONS	P41	64.2	05.6	07.7	22.5
MINESWEEPING OPER. PACIFIC	P207	100.0	00.0	00.0	00.0

PACIFIC SUBMARINE PATROLS

<u>OPERATION</u>	<u>CODE</u>	<u>WIA</u>	<u>DOW</u>	<u>MIA</u>	<u>KIA</u>
SUBMARINE PATROLS	P208	00.5	00.0	98.0	01.5

EUROPEAN-AFRICAN-MIDDLE EASTERN AREA

<u>OPERATION</u>	<u>CODE</u>	<u>WIA</u>	<u>DOW</u>	<u>MIA</u>	<u>KIA</u>
SALERNO LANDINGS	E3	35.2	02.9	35.7	26.2
WEST COAST OF ITALY OP-1944	E4	60.3	02.0	11.7	26.0
ANZIO NETTUNO ADV LANDINGS	E4-1	59.6	01.4	14.6	24.4
BOMBARDMENTS FORMIA-ANZIO	E4-2	100.0	00.0	00.0	00.0
INVASION OF NORMANDY	E5	70.6	01.6	05.7	22.1
INVASION OF SO. FRANCE	E7	85.9	03.6	02.9	07.7

TABLE 3 . RATES OF CASUALTIES BY SHIP TYPE DURING WORLD WAR II OPERATIONS

		N	WIA*	KIA	TOTAL
ACM	AUXILIARY MINE LAYER	4	0.127	0.000	0.127
AD	DESTROYER TENDER	6	0.655	0.154	0.809
AE	AMMUNITION SHIP	11	0.022	0.003	0.025
AF	STORE SHIP	11	0.116	0.015	0.132
AG	MISCELLANEOUS (AUXILIARY SHIP)	9	0.199	0.519	0.718
AGC	GENERAL COMMUNICATION VESSEL	14	0.254	0.020	0.274
AGP	MOTOR TORPEDO BOAT TENDER	13	0.076	0.063	0.139
AGS	SURVEYING SHIP	7	0.098	0.029	0.127
AH	HOSPITAL SHIP	11	0.049	0.022	0.072
AK	CARGO SHIP	55	0.292	0.269	0.562
AKA	ATTACK CARGO SHIP	64	0.180	0.042	0.223
AKN	NET CARGO SHIP	5	1.149	0.434	1.584
AKS	STORES ISSUE SHIP	3	0.053	0.000	0.053
AM	MINE SWEEPER	143	0.321	0.173	0.494
AN	NET LAYING SHIP	28	0.084	0.048	0.133
AO	OILER	64	0.057	0.121	0.178
AOG	GASOLINE TANKER	19	0.104	0.058	0.163
AP	TRANSPORT	39	0.416	0.214	0.630
APA	ATTACK TRANSPORT	176	0.360	0.113	0.473
APC	CAVALRY TRANSPORT	33	0.032	0.009	0.042
APD	HIGH SPEED TRANSPORT	72	0.647	0.469	1.116
APH	TRANSPORT	3	0.167	0.285	0.453
AR	REPAIR SHIP	5	0.546	0.044	0.590
ARB	BATTLE DAMAGE REPAIR SHIP	13	0.072	0.007	0.079
ARD	AUXILIARY REPAIR DOCK	8	0.139	0.023	0.162
ARG	INTERNAL COMBUST. REPAIR SHIP	3	0.082	0.000	0.082
ARL	LANDING CRAFT REPAIR SHIP	13	0.387	0.183	0.571
ARS	SALVAGE SHIP	18	0.204	0.163	0.367
AS	SUBMARINE TENDER	5	0.632	0.443	1.075
ASR	SUBMARINE RESCUE SHIP	4	0.046	0.000	0.046
AT	OCEAN TUG	10	1.618	1.017	2.635
ATA	AUXILIARY OCEAN TUG	16	0.095	0.047	0.143
ATF	FLEET OCEAN TUG	36	0.218	0.074	0.293
ATO	OCEAN TUG, OLD	7	4.322	4.682	9.004
ATR	RESCUE TUG	24	0.049	0.000	0.049
AV	SEAPLANE TENDER	10	0.128	0.262	0.391
AVD	SEAPLANE TENDER (DESTROYER)	4	0.072	0.188	0.261
AVP	SMALL SEAPLANE TENDER	23	0.232	0.064	0.297
AVS	AVIATION SUPPLY SHIP	1	0.168	0.056	0.224
BB	BATTLESHIP	25	0.212	0.274	0.486
CA	HEAVY CRUISER	25	0.615	1.063	1.678
CB	LARGE CRUISER	2	0.020	0.000	0.020
CL	LIGHT CRUISER	47	0.267	0.348	0.615
CM	MINE LAYER	5	2.500	1.120	3.621
CV	AIRCRAFT CARRIER	22	0.228	0.195	0.424
CVE	ESCORT AIRCRAFT CARRIER	62	0.353	0.258	0.612

*rates are per 1000 strength per day

		N	WIA	KIA	TOTAL
CVL	SMALL AIRCRAFT CARRIER	9	0.143	0.072	0.216
DD	DESTROYER	417	0.468	0.509	0.977
DE	ESCORT SHIP	243	0.307	0.234	0.542
DM	DESTROYER MINELAYER	20	0.551	0.349	0.901
DMS	HIGH-SPEED MINELAYER	39	0.978	0.510	1.489
IX	UNCLA MISC (AUXILIARY SHIP)	23	0.356	0.118	0.475
LCF	LANDING CRAFT, INFANTRY	11	2.341	1.308	3.650
LCI	LANDING CRAFT, INFANTRY	617	0.539	0.121	0.660
LCS	LANDING CRAFT, SUPPORT	112	0.614	0.372	0.986
LCT	LANDING CRAFT, TANK	818	0.591	0.150	0.742
LSD	DOCK LANDING SHIP	10	0.115	0.010	0.130
LSM	MEDIUM LANDING SHIP	251	0.667	0.214	0.881
LST	TANK LANDING SHIP	759	0.592	0.269	0.861
LSV	LANDING SHIP, VEHICLE	5	0.106	0.000	0.106
PC	SUBMARINE CHASER	122	0.472	0.208	0.681
PCE	PATROL ESCORT	10	0.474	0.100	0.574
PCS	PATROL CRAFT, SUBMARINE	17	0.253	0.016	0.270
PG	PATROL GUNBOAT	4	1.400	6.327	7.727
PG1	MOTOR GUNBOAT	29	0.271	0.165	0.436
PR	RIVER GUNBOAT	4	0.215	0.153	0.369
PT	MOTOR TORPEDO BOAT	213	0.267	0.023	0.291
PY	PATROL VESSEL(YACHT)	3	0.108	7.255	7.364
SC	SUBMARINE CHASER	170	0.355	0.195	0.551
SS	SUBMARINE	235	0.361	1.534	1.894
YMS	AUXILIARY MOTOR MINE SWEEPER	272	0.342	0.123	0.465
YNG	GATE CRAFT	2	0.208	0.000	0.208
YO	FUEL OIL BARGE	5	1.423	3.795	5.218
YP	PATROL CRAFT	13	9.859	1.971	11.830
YT	HARBOR TUG	4	1.267	0.543	1.811
YTB	LARGE HARBOR TUG	8	0.292	0.000	0.292

TABLE 4. CASUALTY CATEGORY FREQUENCIES AND PERCENTAGES BY SHIP TYPE; WWII

	WIA	WIA %	DOW	DOW %	MLA	MLA %	KIA	KIA %
ACM	1	100.0	0	0.0	0	0.0	0	0.0
AD	68	80.9	0	0.0	2	2.4	14	16.7
AE	7	87.5	0	0.0	0	0.0	1	12.0
AF	15	88.2	0	0.0	0	0.0	2	11.8
AG	23	27.7	2	2.4	1	1.2	57	68.7
AGC	127	92.7	4	2.9	0	0.0	6	4.4
AGP	53	54.6	2	2.1	0	0.0	42	43.3
AGS	10	76.9	1	7.7	0	0.0	2	15.4
AH	15	68.2	6	27.3	0	0.0	1	4.5
AK	199	52.1	3	0.8	157	41.1	23	6.0
AKA	181	80.8	12	5.3	11	4.9	20	8.9
AKN	45	72.6	1	1.6	2	3.2	14	22.6
AKS	3	100.0	0	0.0	0	0.0	0	0.0
AM	468	65.0	27	3.7	69	9.6	156	21.7
AN	7	63.5	0	0.0	0	0.0	4	36.4
AO	233	32.1	13	1.8	336	46.3	144	19.8
AOG	9	64.3	4	28.6	0	0.0	1	7.1
AP	257	66.1	15	3.8	94	24.2	23	5.9
APA	1450	76.0	83	4.4	111	5.8	261	13.7
APC	24	77.4	1	3.2	0	0.0	6	19.3
APD	538	58.0	29	3.1	180	19.4	181	19.5
APH	20	37.0	2	3.7	0	0.0	32	59.2
AR	99	92.5	0	0.0	0	0.0	8	7.5
ARB	20	91.0	1	4.5	0	0.0	1	4.5
ARD	6	85.7	0	0.0	0	0.0	1	14.3
ARG	4	100.0	0	0.0	0	0.0	0	0.0
ARL	78	67.8	7	6.1	0	0.0	30	26.1
ARS	20	55.5	2	5.5	0	0.0	14	38.9
AS	50	58.8	2	2.3	2	2.3	31	36.5
ASR	3	100.0	0	0.0	0	0.0	0	0.0
AT	70	61.4	3	2.6	33	28.9	8	7.0
ATA	2	66.7	0	0.0	0	0.0	1	33.3
ATF	47	74.6	3	4.8	0	0.0	13	20.6
ATO	84	48.0	1	0.6	47	26.8	43	24.6
ATR	2	100.0	0	0.0	0	0.0	0	0.0
AV	174	32.9	4	0.7	282	53.4	68	12.9
AVD	5	27.8	0	0.0	1	5.5	12	66.9
AVP	130	78.3	1	0.6	16	9.6	19	11.4
AVS	3	75.0	1	25.0	0	0.0	0	0.0
BB	1684	43.6	102	2.6	12	0.3	2061	53.4
CA	1804	36.7	45	0.9	1586	32.2	1484	30.2
CB	8	100.0	0	0.0	0	0.0	0	0.0
CL	1590	43.4	92	2.5	253	6.9	1729	47.2
CM	241	69.0	8	2.3	1	0.3	99	28.4
CV	2603	53.9	78	1.6	266	5.5	1885	39.0
CVE	1741	57.8	58	1.9	546	18.1	670	22.2
CVI	511	66.4	24	3.1	6	0.8	229	29.7
DD	6895	47.9	426	2.9	3500	24.3	3565	24.8

	WIA	WIA %	DOW	DOW %	MIA	MIA %	KIA	KIA %
DE	1125	56.8	78	3.9	39	1.9	739	37.3
DM	259	61.2	13	3.1	35	8.3	116	27.4
DMS	431	65.7	23	3.5	1	0.1	201	30.6
IX	33	75.0	2	4.5	2	4.5	7	15.9
LCT	34	64.1	1	1.9	8	15.1	10	18.9
LCG	1	50.0	0	0.0	0	0.0	1	50.0
LCI	1010	81.6	53	4.3	25	2.0	150	12.1
LCS	271	62.3	18	4.1	30	6.9	116	26.7
LCT	255	79.7	15	4.7	30	9.4	20	6.2
LSD	47	92.1	2	3.9	0	0.0	2	3.9
LSM	361	75.7	34	7.1	6	1.2	76	15.9
LST	2277	68.7	81	2.4	280	8.4	675	20.4
LSV	3	100.0	0	0.0	0	0.0	0	0.0
PC	172	69.3	2	0.8	7	2.8	67	27.0
PCE	33	82.5	1	2.5	0	0.0	6	15.0
PCS	30	93.7	1	3.1	0	0.0	1	3.1
PG	60	18.1	5	1.5	168	50.7	98	29.6
PGM	23	62.1	0	0.0	0	0.0	14	37.8
PR	7	58.3	0	0.0	0	0.0	5	41.6
PT	45	91.8	1	2.0	1	2.0	2	4.1
PY	1	1.5	0	0.0	67	98.5	0	0.0
SC	78	64.5	10	8.3	1	0.8	32	26.4
SS	1178	19.0	61	1.0	4501	72.8	444	7.2
YMS	263	73.5	7	1.9	5	1.4	83	23.2
YN	1	100.0	0	0.0	0	0.0	0	0.0
YNG	1	100.0	0	0.0	0	0.0	0	0.0
YO	3	27.3	0	0.0	8	72.7	0	0.0
YP	35	83.3	0	0.0	1	2.4	6	14.3
YT	7	70.0	0	0.0	3	30.0	0	0.0
YTB	1	100.0	0	0.0	0	0.0	0	0.0

APPENDIX A: NAVAL OPERATIONS DURING WWII AND NUMBER OF SHIPS INVOLVED

ASIATIC-PACIFIC AREA

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
PEARL HARBOR-MIDWAY	P1	12/07/41	1	116
WAKE ISLAND	P2	12/08-12/23, 1941	16	4
PHILIPPINE ISLANDS	P3	12/08/41-05/06/42	150	84
NETHERLANDS EAST INDIES	P4	01/23-02/27, 1942	36	3
MAKAMAR STRAIT	P4-1	01/23-01/24, 1942	2	5
BADOENG STRAIT	P4-2	02/19-02/20, 1942	2	8
JAVA SEA	P4-3	02/27/42	1	4
PACIFIC RAIDS	P5	1942		
MARSHALL-GILBERT RAIDS	P5-1	02/01/42	1	21
AIR ACTION OFF BOUGAINEVILLE	P5-2	02/20/42	1	15
WAKE ISLAND RAID	P5-3	02/24/42	1	9
MARCUS ISLAND RAID	P5-4	03/04/42	1	3
SALAMAUS-LAC RAID	P5-5	03/10/42	1	16
CORAL SEA	P6	05/04-05/08, 1942	5	21
MIDWAY	P7	06/03-06/06, 1942	4	64
GUADALCANAL-TULAGI LANDINGS	P8	08/07-08/09, 1942	3	74
CAPTURE/DEFENSE GUADALCANAL	P9	08/10/42-02/08/43	183	251
MAKIN RAID	P10	08/17-08/18, 1942	2	2
EASTERN SOLOMONS	P11	08/23-08/25, 1942	3	20
BUIW-FAISI-TONOLAI RAID	P12	10/05/42	1	10
CAPE ESPERANCE	P13	10/11-10/12, 1942	2	9
SANTA CRUZ ISLANDS	P14	10/26/42	1	24
GUADALCANAL (3d SAVO)	P15	11/12-11/15, 1942	4	41
TASSAFARONGA (4th SAVO)	P16	11/30-12/01, 1942	2	11

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
EASTERN NEW GUINEA OPERATION	P17	12/17/42-07/24/44		
DESIGNATED DUTY/MOTOR TORP.	P17-1	12/17/42-07/24/44	585	10
LAC OCCUPATION	P17-2	09/04-09/22, 1943	19	126
FINSCHHAFEN OCCUPATION	P17-3	09/22/43-02/17/44	149	127
E. NEW GUINEA/CONSOL. SAIDOR	P17-4	01/02-03/01, 1944	59	168
WEWAK-AITAPE OPERATION	P17-5	07/14-07/24, 1944	11	10
SUPPORTING/CONSOLIDATING OP.	P17-6	12/17/42-07/24/44	585	13
WOODLARK ISLAND OCC./CONSOL.	P17-7	06/30-12/07, 1942	161	
RENNEL ISLAND	P18	01/29-01/30, 1943	2	26
CONSOLIDATION SOLOMON ISLAND	P19	02/08/43-03/18/45		
CONSOLIDATION OF SO. SOLOMON	P19-1	02/08-06/20, 1943	133	168
CONSOLIDATION OF NO. SOLOMON	P19-2	10/27/43-03/15/45	505	331
ALEUTIANS OPERATION	P20	03/26-06/02, 1943		
KOMANDORSKI ISLAND	P20-1	03/26/43	1	6
ATTU OCCUPATION	P20-2	05/11-06/02, 1943	23	68
NEW GEORGIA GROUP OP.	P21	06/20-10/16, 1943		
NEW GEORGIA-RENDOVA-VANGUNU	P21-1	06/20-08/31, 1943	73	215
KULA GULF ACTION	P21-2	07/05-07/06, 1943	2	7
KOLOMBANGARA ACTION	P21-3	07/12-07/13, 1943	2	18
VELLA GULF ACTION	P21-4	08/06-08/07, 1943	2	6
VELLA LAVELLA OCCUPATION	P21-5	08/18-10/16, 1943	60	92
ACTION OFF VELLA LAVELLA	P21-6	10/06-10/07, 1943	2	3
BISMARCK ARCHIPELAGO OCC.	P22	06/25/43-05/01/44		
DESIGNATED DUTY/MOTOR TORP.	P22-1	06/25/43-05/01/44	311	8
SUPPORTING AIR ACTION	P22-2	12/15/43-05/01/44	138	4
ARAWA, NEW BRITAIN	P22-3	12/15/43-03/01/44	77	172

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
KAVIENG STRIKE	P22-4	12/25/43	1	8
CAPE GLOUCESTER, NEW BRITAIN	P22-5	12/26/43-03/01/44	66	247
KAVIENG STRIKE	P22-6	01/01/44	1	9
KAVIENG STRIKE	P22-7	01/04/44	1	8
GREEN ISLANDS LANDING	P22-8	02/15-02/19, 1944	5	78
BOMBARDMENTS KAVIENG/RABAU	P22-9	02/18/44	1	10
ANTISHIPPING/BOMB KAVIENG	P22-10	02/21-02/26, 1944	6	10
ANTI/BOMB RABAU/NEW IRELAND	P22-11	02/24-03/01, 1944	6	18
ADMIRALITY ISLAND LANDINGS	P22-12	02/29-04/17, 1944	49	139
SUPPORT/CONSOLIDATION	P22-13	06/26/43-05/01/44	310	4
PACIFIC RAIDS	P23			
MARCUS ISLAND RAID	P23-1	08/31/43	1	18
TARAWA ISLAND RAID	P23-2	09/18/43	1	18
WAKE ISLAND RAID	P23-3	10/05-10/06, 1943	2	40
TREASURY-BOUGAINVILLE OP.	P24	10/27-12/15, 1943		
SUPPORTING AIR ACTIONS	P24-1	10/27-12/15, 1943	50	17
TREASURY ISLAND LANDINGS	P24-2	10/27-11/06, 1943	11	71
CHOISEUL ISLAND DIVERSION	P24-3	10/28-11/04, 1943	8	9
OCC./DEFENSE CAPE TOROKINA	P24-4	11/01-12/15, 1943	45	309
BOMBARDMENT OF BUKA-BONIS	P24-5	10/21-11/01, 1942	12	9
BUKA-BONIS STRIKE	P24-6	11/01-11/02, 1943	2	15
BOMBARDMENT-SHORTLAND AREA	P24-7	11/01/43	1	9
BATTLE-EMPRESS AUGUSTA BAY	P24-8	11/01-11/02, 1943	2	10
RABAU STRIKE	P24-9	11/05/43	1	15
ACTION-EMPRESS AUGUSTA BAY	P24-10	11/08-11/09, 1943	2	7
RABAU STRIKE	P24-11	11/11/43	1	20

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
BATTLE OFF CAPE ST. GEORGE	P24-12	11/24-11/25, 1943	2	5
GILBERT ISLANDS OPERATION	P25	11/13-12/08, 1943	26	229
MARSHALL ISLANDS OPERATION	P26	11/26/43-03/02/44		
AIR ATTACKS	P26-1	11/26/43-03/02/44	97	7
KWAJALEIN AND MAJURO ATOLLS	P26-2	01/29-02/08, 1944	11	385
ENIWETOK ATOLL	P26-3	02/17-03/02, 1944	14	123
ATTACK ON JALUIT ATOLL	P26-4	02/20/44	1	5
MILLE ATOLL	P26-5	03/18/44	1	10
ASIATIC-PACIFIC RAIDS-1944	P27			
TRUK ATTACK	P27-1	02/16-02/17, 1944	2	68
MARIANAS ATTACK	P27-2	02/21-02/22, 1944	2	46
PALAU/YAP/ULITHI/WOLEAI RAID	P27-3	03/30-04/01, 1944	3	124
SAPANG RAID	P27-4	04/19/44	1	4
TRUK/SATAWAN/PONAPE RAID	P27-5	04/29-05/01, 1944	3	109
SOERABAJA RAID	P27-6	05/17/44	1	4
BOMBARDMENT MARCUS RAID	P27-7	10/09/44	1	9
WESTERN NEW GUINEA OPERATION	P28	04/21/44-01/09/45		
TORPEDO BOAT OPERATIONS.	P28-1	04/21-11/15, 1944	209	9
TOEM/WAKDE/SARMI AREA	P28-3	05/17-06/21, 1944	36	128
BLAK ISLAND	P28-4	05/27-06/21, 1944	26	245
NOEMFOOR ISLAND OPERATION	P28-5	07/02-07/23, 1944	22	132
CAPE SANSAPOR OPERATION	P28-6	07/30-08/31, 1944	33	239
SUPPORTING AND CONSOL. OP.	P28-7	04/21-11/15, 1944	209	22
MOROTAI LANDINGS	P28-8	09/11/44-01/09/45	121	242
MARIANAS OPERATION	P29	06/10-08/27, 1944		
NEUTRALIZATION OF JAPANESE BASES IN BONINA/MARIANAS/PACIFIC	P29-1	06/10-08/27, 1944	79	7

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
CAPTURE/OCCUPATION OF SAIPAN	P29-2	06/11-08/10, 1944	61	555
FIRST BONINS RAID	P29-3	06/15-06/16, 1944	2	51
BATTLE OF PHILIPPINE SEA	P29-4	06/19-06/20, 1944	2	132
SECOND BONINS RAID	P29-5	06/24/44	1	44
THIRD BONINS RAID	P29-6	07/03-07/04, 1944	2	52
CAPTURE AND OCCUP. OF GUAM	P29-7	07/12-08/15, 1944	35	455
PALAU/YAP/ULITHI RAID	P29-9	07/25-07/27, 1944	3	58
FOURTH BONINS RAID	P29-10	08/04-08/05, 1944	2	46
WESTERN CAROLINE ISLANDS OP.	P30	08/31-10/14, 1944		
RAIDS ON VOLCANO-BONIN ISLANDS/YAP ISLANDS	P30-1	08/31-09/08, 1944	9	43
CAPTURE OF SO. PALAU ISLANDS	P30-2	09/06-10/14, 1944	39	506
ASSAULTS-PHILIPPINE ISLANDS	P30-3	09/09-09/24, 1944	16	192
LEYTE OPERATION	P31	10/10-12/16, 1944	68	25
LEYTE LANDINGS	P31-1	10/10-11/29, 1944	51	1004
BATTLE OF SURIGAO STRAIT	P31-2	10/24-10/26, 1944	3	106
3d FLEET SUPPORTING OKINAWA	P31-3	10/10/44	1	98
NO. LUZON/FORMOSA ATTACKS	P31-4	10/11-10/14, 1944	1	123
LUZON ATTACKS	P31-5	10/15, 10/17-10/19, 11/05-11/06, 11/13-11/14, 11/19-11/25, 1944	15	621
VISAYAS ATTACKS	P31-6	10/20-10/21, 1944, 11/11/44	3	52
ORMOC BAY LANDINGS	P31-7	12/07-12/13, 1944	7	117
BATTLE OF SAMAR	P31-8	10/24-10/26, 1944	3	
BATTLE OF CAPE ENGANO	P31-9	10/24-10/26, 1944	3	1
SUBMARINE PARTICIPATION	P31-10	10/10-12/16, 1944	68	

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
LUZON OPERATION	P32	12/12/44-04/01/45		
MINDORO LANDINGS	P32-1	12/12/44-12/18/45	7	143
LINGAYEN GULF LANDING	P32-2	01/04-01/18, 1945	15	706
LUZON ATTACKS	P32-3	01/06-01/07, 1945	2	133
FORMOSA ATTACKS	P32-4	01/03-01/04, 01/09, 01/15, 01/21, 1945	5	525
CHINA COAST ATTACKS	P32-5	01/12, 01/16, 1945	2	254
NANSEI SHOTO ATTACK	P32-6	01/22/45	1	132
IWO JIMA OPERATION	P33	02/15-03/16, 1945		
ASSAULT/OCCUPATION IWO JIMA	P33-1	02/15-03/16, 1945	30	770
5TH FLEET RAIDS HONSHU/NANSEL SHOTO	P33-2	02/15-03/16, 1945	30	361
BOMBARDMENTS OF IWO JIMA	P33-3	11, 11/44-01/24/45	75	51
OKINAWA GUNTO OPERATION	P34	03/17-06/30, 1945		
ASSAULT/OCCUPATION	P34-1	03/24-06/30, 1945	99	2096
5TH & 3d FLEET RAIDS	P34-2	03/17-06/11, 1945	87	247
3d FLEET OP. AGAINST JAPAN	P35	07/10-08/15, 1945	37	522
KURILE ISLANDS OPERATION	P36	02/01/44-08/11/45		
MASASHI/WAN/KURABU/ZAKI	P36-1	02/04/44	1	9
MATSUWA	P36-2	06/13/44	1	14
KURABU ZAKI	P36-3	06/26/44	1	13
MATSUWA	P36-4	11/21/44	1	11
SURIBACHI WAN	P36-5	01/05/45	1	12
KURABU ZAKI	P36-6	02/18/45	1	12
MATSUWA	P36-7	03/16/45	1	10
SEARCH IN OKHOTSK SEA AND BOMBARDMENT OF SURIBACHI	P36-8	05/19/45	1	5

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
KURILE ISLANDS OPERATION /CONSOLIDATION MATSUWA	P36-9	06/11-06/12, 1945	2	7
ATTACK ENEMY CONVOY	P36-10	06/25/45	1	9
SEARCH IN OKHOTSK SEA AND BOMBARDMENT SURIBACHI WAN	P36-11	07/17-07/19, 1945, 07/22/45	4	21
ANTISHIPPING SWEEP/BOMB. AND MATSUWA/KURABUZAKI/SURIBACHI	P36-12	06/11/45	1	13
BORNEO OPERATIONS	P37	04/27-07/20, 1945		
TARAKAN ISLAND OPERATION	P37-1	04/27-05/20, 1945	33	79
BRUNEI BAY OPERATIONS	P37-2	06/07-07/18, 1945	42	81
BALIKPAPAN OPERATIONS	P37-3	06/18-07/20, 1945	33	240
TINIAN CAPTURE	P38	07/24-08/01, 1944	9	229
CONSOLIDATION S. PHILIPPINES	P39	02/28-07/20, 1945		
PALAWAN ISLANDS LANDINGS	P39-1	02/28-03/10, 1945	11	123
VISAYEN' ISLAND LANDINGS	P39-2	03/01-04/20, 1945	51	190
MINDANAO ISLAND LANDINGS	P39-3	03/08-07/20, 1945	135	425
ZULU ARCHIPELAGO LANDINGS	P39-4	04/02-04/20, 1945	19	59
SUPPORTING MINE SWEEPING	P39-5	03/01-05/15, 1945	76	14
HOLLANDIA OPERATION	P40	04/21-06/01, 1944	42	433
MANILA BAY-BICOL OPERATIONS	P41	01/29-04/16, 1945		
ZAMBALES-SUBIC BAY	P41-1	01/29-01/31, 1945	3	150
NASUGBU	P41-2	01/31-02/10, 1945	11	93
MARIVELES-CORREGIDOR	P41-3	02/14-02/28, 1945	15	133
MINE SWEEPING OF MANILA BAY	P41-4	02/24-04/15, 1945	51	15
EL FRAILE (FORT DRUM)	P41-5	04/12/45	1	4
CARABAO ISLAND, MANILA BAY	P41-6	04/16/45	1	12

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
MINESWEEPING OP. PACIFIC	P207	06/23/45-03/02/46	253	113
TSUGARU STRAITS	P207-1	09/07-10/18, 1945	42	16
TOKYO BAY	P207-2	08/28-09/03, 1945	7	21
NAGOYA	P207-3	09/28-10/26, 1945	29	55
SENDAL-CHOSHI	P207-4	09/10-09/15, 1945	6	8
WAKANOURA-KLI	P207-5	09/11-10/02, 1945	22	35
KOCHI-SHIKOKU	P207-6	09/08-11/08, 1945	62	17
BUNGO-SUIDO	P207-7	09/22-10/31, 1945	40	55
OMAI-SAKI	P207-8	12/11-12/31, 1945	21	5
KOBE	P207-9	11/28/45-03/09/46	102	66
KURE-HIROSHIMA	P207-10	10/27/45-02/26/46	123	36
KAGOSHIMA	P207-11	09/01-09/08, 1945	8	11
NAGASAKI	P207-12	09/10-09/16, 1945	7	17
SASEBO	P207-13	09/09-10/17, 1945	39	36
ARCADIA	P207-14	09/01-09/07, 1945	7	33
VAN DIEMAN STRAITS	P207-15	09/15-12/01, 1945	78	22
KADOURA	P207-16	10/24-11/29, 1945	37	2
TSUSHIMA STRAITS	P207-17	10/12/45-04/14/46	185	77
FUKUOKA	P207-18	10/13/45-01/11/46	91	69
TACHIBANA WAN	P207-19	12/14/45-01/26/46	44	18
FUSAN	P207-20	09/28/45-01/29/46	124	15
"RICKSHAW" (KYUSHU-KOREA AREA)	P207-21	10/19-12/01, 1945	44	17
"KLONDIKE" (E.CHINA SEA-RYUKYUS)	P207-22	10/27-11/07, 1945	12	34
"SKAGWAY" (E.CHINA SEA-RYUKYUS AREA)	P207-23	08/14-11/09, 1945	88	124
"RENO" (E.CHINA SEA-RYUKYUS AREA)	P207-24	11/02-11/28, 1945	27	9

<u>OPERATION</u>	<u>CODE</u>	<u>DATE</u>	<u>#DAYS</u>	<u>#SHIPS</u>
YULIN'AN BAY AREA	P207-26	02/15-03/02, 1946	16	9
EAST HAINAN AREA	P207-27	03/01-03/02, 1946	2	7
YANGTZE RIVER APPROACHES	P207-28	02/22-03/02, 1946	9	19
SUB. WAR PATROLS (PACIFIC)	P208	12/07/41-09/02/45	206	

EUROPEAN-AFRICAN-MIDDLE EASTERN AREA

NO. AFRICAN OCCUPATION	E1	11/08/42-07/09/43	244	
ALGERIA-MOROCCO LANDINGS	E1-1	11/08-11/11, 1942	4	103
ACTIONS OFF CASABLANCA	E1-2	11/08/42	1	15
TUNISIAN OPERATIONS	E1-3	11/08/42-07/09/43	244	117
SICILIAN OCCUPATION	E2	07/09-07/15, 1943; 07/28-08/17, 1943	28	540
SALERNO LANDINGS	E3	09/09-09/21, 1943	13	292
WEST COAST OF ITALY OP-1944	E4	01/22-06/17, 1944	147	7
ANZIO NETTUNO ADV LANDINGS	E4-1	01/22-03/01, 1944	39	348
BOMBARDMENTS FORMIA-ANZIO	E4-2	05/12-06/04, 1944	24	30
ELBA AND PIANOSA LANDINGS	E4-3	06/17/44	1	42
INVASION OF NORMANDY	E5	06/06-06/25, 1944	20	751
NORTHEAST GREENLAND OP.	E6	07/10-11/17, 1944	131	
INVASION OF SO. FRANCE	E7	08/15-09/25, 1944	42	581
REINFORCEMENT OF MALTA	E8	04/14-04/21, 1942; 05/03-05/16, 1942	21	8

APPENDIX B: TYPES OF SHIPS INVOLVED IN WORLD WAR II OPERATIONS

ASIATIC-PACIFIC AREA

<u>OPERATION</u>	<u>CODE</u>	
PEARL HARBOR-MIDWAY	P1	116 SHIPS; AD:2, AE:1, AG:3, AH:1, AK:1, AKS:2, AM:5, AMC:1, AO:2, APD:2, AR:2, ARB:1, AS:1, ASR:1, AT:2, ATO:1, AV:2, AVD:1, AVP:2, BB:8, CA:2, CL:6, CM:1, CV:1, DD:30, DM:8, DMS:4, PG:1, PT:11, SS:11
WAKE ISLAND	P2	04 SHIPS; ARD:1, DD:1, SS:2
PHILIPPINE ISLANDS OPERATION	P3	87 SHIPS; ABD:1, AD:1, AG:1, AM:6, AO:1, AS:3, ASR:1, AT:2, AVD:1, AVP:1, CA:1, CL:2, DD:11, DE:1, PG:2, PR:4, PT:6, PY:1, SS:37, TUG:1, YCHT:1, YFB:1, YT:1
NETHERLANDS EAST INDIES	P4	
MAKAMAR STRAIT	P4-1	05 SHIPS; DD:4, SS:1
BADEOENG STRAIT	P4-2	08 SHIPS; DD:5, DE:1, SS:2
JAVA SEA	P4-3	04 SHIPS; CA:1, DD:3
PACIFIC RAIDS-1942	P5	64 SHIPS; AO:2, CA:16, CL:1, CV:7, DD:38
CORAL SEA	P6	21 SHIPS; AO:1, CA:6, CV:2, DD:12
MIDWAY	P7	64 SHIPS; AO:1, AS:1, ATO:1, CA:7, CL:1, CV:3, DD:15, PT:11, SS:24
GUADALCANAL-TULAGI LANDINGS	P8	74 SHIPS; AKA:6, AP:1, APA:12, APD:4, AV:1, AVP:1, BB:1, CA:9, CL:2, CV:3, DD:28, DM:1, DMS:5
CAPTURE/DEFENSE OF GUADALCANAL	P9	252 SHIPS; AG:1, AGP:2, AK:1, AKA:15, AO:1, AP:1, APA:15, APD:8, AT:1, ATO:1, AV:1, AVD:1, AVG:1, BB:1, CA:5, CL:10, CV:4, DD:73, DM:4, DMS:13, IX:1, LCT:12, PC:1, PT:51, SS:27, YP:1
MAKIN RAID	P10	02 SHIPS; SS:2

EASTERN SOLOMONS	P11	20 SHIPS; BB:1, CA:3, CL:1, CV:2, DD:12, SS:1
BUN-FAISI-TONOIAI RAID	P12	10 SHIPS; CA:2, CL:2, CV:1, DD:5
CAPE ESPERANCE	P13	09 SHIPS; CA:2, CL:2, DD:5
SANTA CRUZ ISLANDS	P14	24 SHIPS; AV:1, BB:1, CA:3, CL:3, CV:2, DD:14
GUADALCANAL (3D SAVO)	P15	41 SHIPS; AKA:2, APA:4, BB:2, CA:4, CL:4, CV:1, DD:21, DMS:2, SS:1
TASSAFARONGA (4TH SAVO)	P16	11 SHIPS; CA:4, CL:1, DD:6
EASTERN NEW GUINEA OPERATION	P17	454 SHIPS; AF:1, AGP:7, AK:1, AO:1, APC:9, APD:22, APH:1, ARB:1, ARL:3, AVP:1, CL:3, DD:88, LCI:63, LCT:108, LST:100, PC:7, PG:3, SC:18, SS:9, YF:3, YMS:5
RENNEL ISLAND	P18	26 SHIPS; APD:1, ATF:1, CA:3, CL:4, CV:1, CVE:1, DD:15
CONSOLIDATION SOLOMON ISLANDS	P19	
CONSOLIDATION OF SO. SOLOMONS	P19-1	168 SHIPS; AGP:2, AGS:1, AK:11, AKA:3, AM:3, AN:2, AO:4, AOG:1, AP:1, APA:10, APC:8, APD:5, APH:1, ASR:1, ATF:1, ATO:2, AV:1, BB:1, CL:8, DD:47, DM:7, DMS:1, LCT:15, LST:8, PT:5, SC:6, SS:6, YAG:1, YO:1, YP:5
CONSOLIDATION OF NO. SOLOMONS	P19-2	334 SHIPS; AGP:9, AK:5, AN:2, APC:3, APD:2, AVP:4, CL:7, DD:69, DE:11, LCGM:1, LCI:44, LCM:1, PGM:12, PT:152, SC:4, YMS:6, YP:1
ALEUTIANS OPERATION	P20	
KOMANDORSKI	P20-1	06 SHIPS; CA:1, CL:1, DD:4.
ATTU OCCUPATION	P20-2	68 SHIPS; AGS:1, AK:1, AO:2, AP:3, APA:4, APD:1, AT:1, AVD:1, AVP:1, BB:5, CA:5, CL:4, CVE:1, DD:26, DM:2, DMS:6, PC:1, PG:1, SS:2

NEW GEORGIA GROUP OPERATION	P21	
NEW GEORGIA--RENDOVA--VANGUNU	P21-1	215 SHIPS; AKA:2, APA:4, APC:8, APD:14, APH:1, ATF:1, AVP:1, C:3, CL:9, DD:47, DM:6, DMS:6, LCI:34, LCT:40, LST:21, PT:15, SS:3
KULA GULF ACTION	P21-2	07 SHIPS; CL:3, DD:4
KOLOMBANGARA ACTION	P21-3	18 SHIPS; CL:4, DD:14
VELLA GULF ACTION	P21-4	06 SHIPS; DD:6
VELLA LAVELLA OCCUPATION	P21-5	92 SHIPS; APD:9, ATF:9, C:1, CL:1, DD:30, LCI:16, LST:21, SC:5
ACTIONS OFF VELLA LAVELLA	P21-6	03 SHIPS; DD:3
BISMARCK ARCHIPELAGO OPERATION	P22	
		716 SHIPS; AF:2, AGP:3, AK:1, AKA:2, AO:1, APA:4, APC:10, APD:36, ARB:1, ATF:3, ATO:1, AV:1, AVP:2, BB:2, C:5, CL:8, CV:3, CVE:2, CVL:3, DD:212, DMS:4, IX:3, LCI:36, LCT:122, LSD:3, LST:151, PC:20, PF:5, PT:7, SC:23, SS:3, YF:2, YMS:34, YP:1
PACIFIC RAIDS--1943	P23	
		76 SHIPS; BB:1, CA:3, CL:9, CV:6, CVL:6, DD:48, SS:3
TREASURY--BOUGAINVILLE OPER.	P24	
		496 SHIPS; AK:3, AKA:6, AM:4, APA:20, APC:4, APD:35, ATF:11, AV:3, AVP:2, C:3, CL:24, CV:5, CVL:4, DM:8, DMS:8, DD:162, LCI:31, LCT:28, LST:56, PC:2, PT:66, SC:2, SS:3, YMS:3, YP:3
GILBERT ISLANDS OPERATION	P25	
		229 SHIPS; AG:1, AH:2, AK:3, AKA:4, AKS:1, AM:3, AN:2, AO:15, AOG:1, AP:3, APA:16, APC:2, ARB:1, ARS:1, ASR:1, AT:1, ATF:3, AV:1, AVP:1, BB:13, CA:9, CL:4, CM:1, CV:6, CVE:7, CVL:5, DD:60, DE:15, IX:1, LCT:11, LSD:2, LST:25, PY:1, SC:1, SS:3, YMS:2, YOG:1

MARSHALL ISLANDS OPERATION	P26	531 SHIPS; AE:1, AGC:2, AGS:1, AH:2, AK:5, AKA:8, AM:12, AN:2, AO:23, AP:9, APA:36, APD:6, AT:2, ATF:8, AVP:2, BB:20, CA:18, CL:8, CV:9, CVE:14, CVL:8, DD:144, DE:30, DM:2, DMS:10, IX:5, LCI:31, LCT:19, LSD:6, LST:59, SC:12, SS:6, YMS:11
ASIATIC-PACIFIC RAIDS-1944	P27	364 SHIPS; AO:36, BB:22, CA:33, CL:19, CV:20, CVE:2, CVL:20, DD:173, DE:14, SS:25
WESTERN NEW GUINEA OPERATION	P28	1041 SHIPS; AF:2, AGC:1, AGP:10, AO:3, AOG:3, APA:1, APD:18, ARB:1, ATF:2, ATO:2, ATR:1, AV:3, AVP:8, CA:3, CL:20, CV:2, CVE:11, CVL:3, DD:244, DE:40, LCI:186, LCT:70, LSD:1, LST:301, LT:1, PC:28, PF:39, SC:9, SS:8, YF:4, YMS:16
MARIANAS OPERATION	P29	1417 SHIPS; AE:2, AFT:2, AGC:3, AGS:2, AH:7, AK:16, AKA:14, AKN:3, AM:12, AN:7, AO:76, AP:21, APA:55, APC:1, APD:16, APH:1, ARB:1, ARD:3, ARL:2, ARS:4, AS:1, AT:2, ATF:11, AV:2, AVD:1, AVP:4, BB:38, CA:35, CL:77, CM:1, CV:40, CVL:34, CVE:33, DD:452, DE:76, DMS:22, IX:5, LCI:58, LCT:50, LSD:8, LST:94, PC:16, PCS:11, SC:21, SS:40, YMS:33, YF:4
WESTERN CAROLINE ISLANDS OPER.	P30	747 SHIPS; AE:4, AFT:1, AGC:1, AGP:1, AGS:1, AH:4, AK:8, AKA:5, AKN:1, AM:6, AN:3, AO:63, AP:5, APA:20, APD:5, APH:2, AR:1, ARB:1, ARD:2, ARG:2, ARL:1, ARS:1, ATF:4, AV:2, AVD:1, AVP:3, BB:18, CA:14, CL:25, CV:22, CVE:27, CVL:17, DD:198, DE:62, DM:2, DMS:5, IX:1, LCI:41, LCT:25, LSD:4, LST:52, PC:13, PCS:3, PF:1, SC:12, SS:40, YMS:17

LEYTE OPERATION
LEYTE LANDINGS

P31
P31-1 1009 SHIPS; AE:1, AGC:6,
AGP:9, AH:1, AK:13, AKA:18,
AKN:1, AM:12, AN:1, AO:6,
AOG:1, AP:19, APA:75, APC:1,
APD:25, APH:3, ARB:2, ARD:1,
ARL:2, ARS:3, AT:2, ATF:6,
ATO:2, ATR:1, AV:1, AVP:5,
BB:7, CA:3, CL:9, CVE:20,
DD:142, DE:41, DM:2, DMS:7,
IX:8, LCI:156, LCT:22, LSD:26,
LSM:21, LST:214, LSV:4, LT:5,
PC:21, PCE:2, PCER:9, PCS:3,
PF:24, PG:1, SC:11, SS:9,
YF:2, YMS:21, YOG:1, YP:1

BATTLE OF SURIGAO STRAIT P31-2 107 SHIPS; AGP:3, AO:3, AVP:2,
BB:7, CA:4, CL:8, CV:8, CVE:1,
CVL:8, DD:52, DE:3, LT:1,
SS:7

3D FLEET SUPPORTING OKINAWA P31-3 98 SHIPS; AO:3, ATF:2, BB:6,
CA:4, CL:10, CV:9, CVL:8,
DD:55, DE:1

NO. LUZON/FORMOSA ATTACKS P31-4 123 SHIPS; AO:9, ATF:2, BB:6,
CA:4, CL:10, CV:9, CVE:4,
CVL:8, DD:63, DE:7, SS:1

LUZON ATTACKS P31-5 621 SHIPS; AO:44, ATF:3,
BB:34, CA:22, CL:47, CV:45,
CVE:21, CVL:35, DD:326, DE:44

VISAYES ATTACKS P31-6 52 SHIPS; BB:6, CL:5, CV:4,
CVE:1, CVL:4, DD:32

ORMOC BAY LANDINGS P31-7 117 SHIPS; AM:9, APD:9, ATR:1,
DD:22, LCI:47, LSM:23, LST:4,
SC:2

BATTLE OF CAPE ENGANO P31-9 01 SHIP; CL:1

LUZON OPERATION
MINDORO LANDINGS

P32
P32-1 145 SHIPS; AM:9, APD:9, BB:1,
CA:1, CL:5, DD:25, DE:2,
LCI:44, LCT:2, LSD:1, LSM:12,
LST:23, LT:1, FT:2, ST:1,
YMS:7

LINGAYEN GULF LANDING P32-2 710 SHIPS; AGC:5, AGP:1, AK:1,
AKA:7, AM:10, AO:6, AP:6,
APA:34, APC:1, APD:9, APH:2,
ARL:1, ARS:2, AT:1, ATF:4,
ATO:1, ATR:1, AV:1, AVP:2,
BB:6, CA:3, CL:6, CM:1, CV:1,
CVE:19, DD:89, DE:41, DM:3,
DMS:10, IX:3, LCI:86, LCT:61,
LSD:4, LSM:48, LST:158, LSV:3,
LT:3, PC:7, PCER:5, PCS:3,
SC:4, SS:1, YMS:50

3D FLEET-LUZON ATTACKS	P32-3	134 SHIPS; AFT:1, AO:17, APC:1, ATF:2, BB:6, CA:3, CL:10, CV:7, CVE:6, CVL:5, DD:60, DE:14, LCI:2
FORMOSA ATTACKS	P32-4	528 SHIPS; AFT:3, AO:73, ATF:6, BB:21, CA:12, CL:39, CV:30, CVE:18, CVL:20, DD:242, DE:61, LCI:2, LSM:1
CHINA COAST ATTACKS	P32-5	256 SHIPS; AFT:2, AO:35, ATF:4, BB:12, CA:6, CL:20, CV:16, CVE:9, CVL:10, DD:116, DE:26
NANSEL SHOYO ATTACK	P32-6	133 SHIPS; AO:20, AT:3, BB:6, CA:3, CL:8, CV:6, CVE:5, CVL:5, DD:58, DE:19
IWO JIMA OPERATION	P33	
ASSAULT OCCUPATION IWO JIMA	P33-1	771 SHIPS; AE:2, AFT:1, AGC:4, AGS:1, AH:3, AK:4, AKA:17, AKN:2, AM:17, AN:5, AO:31, AOG:3, AP:10, APA:55, APD:14, APH:1, ARB:1, ARL:1, ARS:4, AT:1, ATF:7, ATR:5, AV:1, AVP:3, BB:15, CA:9, CB:1, CL:13, CM:1, CV:11, CVE:18, CVL:5, DD:133, DE:64, DM:9, DMS:6, LCFF:1, LCI:58, LCS:12, LCT:19, LSD:3, LSM:31, LST:68, LSV:1, PC:9, PCE:1, PCER:1, PCS:10, SC:11, SS:52, YMS:15, YP:1
5TH FLEET RAIDS HONSHU/ NANSEL SHOTO	P33-2	361 SHIPS; BB:22, CA:14, CB:3, CL:29, CV:33, CVL:15, DD:217, DE:4, SS:24
BOMBARDMENTS OF IWO JIMA	P33-3	51 SHIPS; CA:18, DD:32, DM:1

OKINAWA GUNTO OPERATION
ASSAULT/OCCUPATION

P34
P34-1 2110 SHIPS; AD:2, AE:3, AF:6,
AFD:1, AFD(L):1, AG:1, AGC:8,
AGL:1, AGS:5, AH:7, AK:30,
AKA:55, AKN:3, AKS:3, AM:70,
AMS:1, AMC:1, AN:10, AO:38,
AOG:13, AP:10, APA:141, APC:4,
APD:58, APH:2, AR:1, ARB:3,
ARD:4, ARG:1, ARL:7 ARS:8,
AT:2, ATA:12, ATF:14, ATR:11,
AV:5, AVD:2, AVP:9, AVS:1,
BB:13, CA:11, CL:9, CM:3, CV:13,
CVE:21, CVL:8, DD:135, DE:77,
DM:14, DMS:12, IX:9, LCFF:5,
LCI:210, LCS:88, LCT:130,
LSD:6, LSM:150, LST:359,
LSV:5, PB:7, PC:21, PCE:8,
PCS:16, PG:1, PGM:18, SC:43,
SS:82, YMS:57, YNG:2, YO:1,
YOGL:12, YP:3, YSD:1, YTB:4,
YTL:1, YW:1

5TH & 3D FLEET RAIDS

P34-2 247 SHIPS; AE:6, AF:1, AH:1,
AK:7, AKA:1, AM:1, AO:42,
AT:1, ATF:6, BB:11, CA:4,
CB:2, CL:15, CV:12, CVE:14,
CVL:7, DD:82, DE:29, LCT:1,
LSM:3, SS:1

3D FLEET OPER. AGAINST JAPAN

P35 522 SHIPS; AE:8, AF:1, AH:3,
AKA:2, AM:61, AMS:1, AO:52,
APA:3, ARS:2, ATF:5, AV:5,
AVP:9, BB:11, CA:7, CB:2,
CL:21, CV:10, CVE:21, CVL:6,
DD:106, DE:61, DM:7, DMS:5,
LST:2, PCER:1, PGM:15, SC:7,
SS:53, YMS:35

KURILE ISLANDS OPERATION

P36 137 SHIPS; CA:4, CL:31,
DD:102

BORNEO OPERATIONS
TARAKAN ISLAND OPERATION

P37
P37-1 79 SHIPS; AF:1, AGC:1, AGP:1,
AK:1, ATO:1, ATR:1, CL:2,
DD:12, DE:2, LCI:17, LCS:1,
LCT:1, LSD:1, LSM:4, LST:20,
PC:1, PCER:1, SC:2, YMS:9

BRUNEI BAY OPERATIONS

P37-2 83 SHIPS; AGC:1, AGP:1, AM:5,
APD:2, ARL:1, CL:6, DD:13,
LCI:6, LCS:5, LCT:1, LSC:2,
LSM:21, LST:5, SC:1, YMS:13

BALIKPAPAN OPERATIONS	P37-3	240 SHIPS; AGC:1, AGP:2 AK:2, AM:3, AN:1, AO:1, AOG APD:8, ARL:1, ARS:1, ATR:2, CL:7, CVE:2, DD:25, DE:8, IX:1, LCFF:1, LCI:33, LCS:9, LCT:25, LSD:1, LSM:26, LST:35, PC:2, SC:3, YMS:37, YP:1
TINIAN CAPTURE	P38	230 SHIPS; AKA:1, AM:3, AN:3, AO:18, AP:2, APA:6, APD:4, APH:1, ARB:1, ARL:1, ARS:1, AT:1, ATF:2, BB:4, CA:3, CL:4, CV:1, CVE:5, DD:49, DE:19, DMS:2, LCI:33, LCT:22, LSD:2, LST:32, PC:4, PCS:5, SC:1
CONSOLIDATION SO. PHILIPPINES	P39	811 SHIPS; AGP:2, AM:8, AN:1, AO:2, AOG:1, APD:10, ATA:1, ATF:3, ATR:3, CL:7, DD:81, DE:9, LCFF:1, LCI:194, LCS:33, LCT:32, LSM:127, LST:199, PC:3, PCER:3, PGM:4, PT:23, SC:9, YMS:55
HOLLANDIA OPERATION	P40	433 SHIPS; AK:3, AKA:4, AO:11, APA:10, APC:4, APD:24, ARL:1, ATO:1, AVP:1, BB:5, CA:8, CL:8, CV:8, CVE:4, CVL:11, DD:121, DE:16, DMS:7, IX:1, LCI:35, LCT:40, LSD:6, LST:74, PF:12, SC:9, YF:1, YMS:8
MANILA BAY-BICOL OPERATIONS	P41	407 SHIPS; AGC:1, AGP:1, AK:2, AKA:7, AM:18, AP:4, APA:12, APD:14, ARS:3, ATF:2, CA:2, CL:8, DD:44, DE:10, LCI:86, LCS:13, LCT:12, LSM:36, LST:46, LSV:1, PC:7, PT:19, SC:6, YMS:53
MINESWEEPING OPER. PACIFIC	F207	949 SHIPS; ACM:2, AM:315, AMC:10, AMS:6, APA:3, APD:3, ATA:2, ATF:1, DD:11, DM:22, DMS:39, LCFF:2, LCI:70, LCS:38, LST:5, PC:4, PCER:4, PGM:46, SC:18, SS:1, XAK:1, YMS:346

PACIFIC SUBMARINE PATROLS

<u>OPERATION</u>	<u>CODE</u>	
SUBMARINE PATROLS	P208	206 SHIPS; SS:206 48

EUROPEAN-AFRICAN-MIDDLE EASTERN AREA

<u>OPERATION</u>	<u>CODE</u>	
NORTH AFRICAN OCCUPATION	E1	
ALGERIA-MOROCCO LANDINGS	E1-1	103 SHIPS; AGC:1, AK:1, AKA:5, AM:3, AO:5, AP:11, APA:9, APD:1, APM:1, ATF:1, AVP:1, BB:3, CA:2, CL:4, CM:2, CV:1, CVE:4, DD:38, DMS:5, SS:5
ACTIONS OFF CASABLANCA	E1-2	15 SHIPS; BB:1, CA:3, CL:1, DD:10
TUNISIAN OPERATIONS	E1-3	117 SHIPS; AKA:1, AM:4, AP:1, APA:2, AR:2, DD:3, DMS:1, LCI:56, LCT:7, LST:7, PC:3, PT:18, SC:3, YMS:9
SICILIAN OCCUPATION	E2	
		541 SHIPS; AGC:1, AKA:7, AKN:1, AM:7, AP:9, APA:13, ARB:11, ARS:1, AT:1, ATF:3, AVP:1, CL:9, CM:1, DD:64, LCI:101, LCT:113, LST:7, PC:26, PT:20, SC:41, YMS:7, YT:1, YTB:2, YTL:2
SALERNO LANDINGS	E3	
		293 SHIPS; AGC:1, AKA:4, AM:11, AP:2, APA:7, ARB:9, ARS:2, AT:1, ATF:3, AVP:1, CL:3, DD:18, LCI:78, LCT:32, LST:58, PC:15, SC:22, YMS:20, YT:3, YTB:2, YTL:1

<u>OPERATION</u>	<u>CODE</u>	
WEST COAST OF ITALY OP-1944	E4	
ANZIO NEPTUNO ADV LANDINGS	E4-1	349 SHIPS; AM:16, ARB:1, ARBC:1, ARS:2, ATF:1, ATR:1, AVP:1, CL:15, DD:23, DE:5, LCI:124, LCT:39, LST:20, PC:30, PT:5, SC:36, YMS:28, YTB:1
BOMBARDMENTS FORMIA-ANZIO	E4-2	30 SHIPS; CL:11, DD:15, DE:2, PC:1, SC:1
ELBA AND PIANOSA LANDINGS	E4-3	42 SHIPS; APD:2, LCI:19, LCT:17, LST:4

INVASION OF NORMANDY

E5

760 SHIPS; ACM:1, AGC:1,
AKA:1, AM:11, AP:4, APA:9,
APD:2, ARL:2, ARS:3, ATA:3,
ATF:4 ATO:5, ATR:6, AVP:1,
BB:3, CA:3, CM:1, DD:32, DE:3,
DMS:1, LCC:9, LCF:11, LCGL:9,
LCI:128, LCT:247, LST:172,
PC:18, PT:32, SC:17, YMS:21

INVASION OF SO. FRANCE

E7

582 SHIPS; ACM:2, AD:1, AE:1,
AF:2, AGC:1, AH:1, AK:1,
AKA:7, AM:26, AN:2, AO:4,
AP:7, APA:7, APD:5, AR:2,
ARB:1, ARL:1, ARS:4, ASR:18,
ATA:3, ATF:5, ATR:1, AVP:1,
BB:3, CA:3, CL:5, CVE:2,
DD:45, DE:7, DMS:1, LCI:97,
LCT:94, LST:76, PC:27, PT:42,
SC:31, YMS:34, YO:3, YTB:2,
YTL:6, YW:1

REINFORCEMENT OF MALTA

E8

8 SHIPS; CV:2, DD:6

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19 ABSTRACT (Continue on reverse if necessary and identify by block number)						
Casualty rates were calculated for ships participating in World War II operations and Marine assault forces involved in the capture of Western Pacific islands. The rate of shipboard casualties in the Asiatic-Pacific theater across all operations was 0.56 per 1000 per day, while the rate in the European theater was 0.84. Individual ship-based operations ranged from 0.01 to 50.50. Among afloat operations there were 115 men wounded for every 100 killed. Eight ship types had KIA rates more than double their WIA rates; among these only submarines and oilers involved more than ten vessels. Ground assault force rates averaged 15 times higher than the ship rates. Combat troop rates declined dramatically after the first day of the operations. The WIA rate was three times higher than the KIA rate over the course of ground operations. The highest rates for both afloat and ashore operations were seen for brief engagements occurring early in the war. Keywords: Navy, Marine Corps, Casualties, Shipboard, Troops (Continued on reverse)						
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