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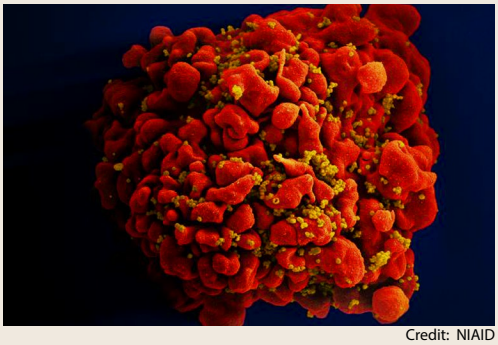

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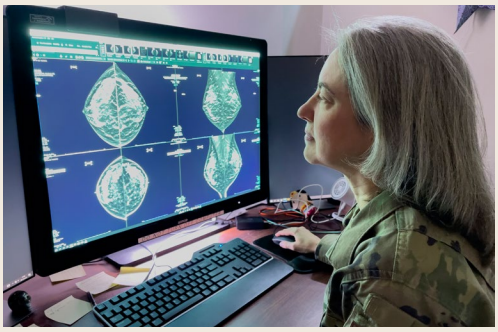

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Update: Routine Screening for Antibodies to Human Immunodeficiency Virus, U.S. Armed Forces, Active and Reserve Components, January 2018–June 2023

This report provides an update through June 2023 of routine screening results for antibodies to the human immunodeficiency virus (HIV) among members of the U.S. military. Consistent with prior year reports, the HIV-antibody seropositivity rate for 2022 among Army active component service members (0.25 per 1,000 soldiers tested) remained above active component members of the Air Force (0.17 per 1,000 airmen tested), Navy (0.16 per 1,000 sailors tested), Coast Guard (0 per 1,000 Coast Guardsmen tested), and Marine Corps (0.11 per 1,000 Marines tested). In comparison to 2022, the mid-year HIV seropositivity rates as of June 2023 declined for active component service members of the Army and Air Force but increased for the Navy and Marine Corps.

What are the new findings?

From January 2018 through June 2023, approximately 7 million U.S. military service members (active component, reserve component, and national guard) were tested for antibodies to HIV, and 1,502 were identified as HIV-antibody positive (seropositivity: 0.21 per 1,000 tested). The rate among men persisted above women throughout the surveillance period.

What is the impact on readiness and force health protection?

For over 30 years, the routine screening for antibodies to HIV has enabled the U.S. military to provide adequate and timely medical care to infected service members. Future studies should fully describe seropositivity rates by age and race, to further elucidate trends for the most at-risk populations. Additionally, health-seeking behaviors and co-morbidities should be evaluated to identify those at highest risk for HIV infection.

The Department of Defense (DOD) has conducted an active surveillance program for HIV since 1986, when reliable screening methods for the virus became widely available. The DOD surveillance program consists of screening all service members at specific points in time: prior to entry (all accessions must be HIV-negative prior to start of service), before deployment or any change in status (change in component, between branches, or commissioning), and once every 2 years while a military member.[1]

Before 2009, the DOD screening program employed laboratory techniques that detected only HIV-1-type infections. Since 2009, all programs have adopted methods that detect antibodies to HIV-1 and HIV-2. Although HIV-2 infection is rare in the U.S., it is more prevalent in other parts of the world where service members may support military operations. This report refers to the target of the screening programs as simply "HIV" without specifying types.

Infection with HIV is medically disqualifying for entry into service with the U.S. military. Following significant advances in the diagnosis, treatment, and prevention of HIV, in June 2022 the DOD updated its policy, preventing the discharge or separation of service members living with HIV who have an undetectable viral load solely on the basis of their HIV-positive status.[1] In addition, HIV-positive personnel are not non-deployable solely for a positive status; decisions on deployability are made on an individual basis and must be justified by the service member's inability to perform the duties to which he or she would be assigned.[2]

Summaries of HIV seropositivity for members of the U.S. military have been archived with the *MSMR* since 1990. This report summarizes numbers and trends of newly identified HIV-antibody seropositivity from January 1, 2018 through June 30, 2023 among military members of the active and reserve components of 5 services under the U.S. Armed Forces, as well as the Army National Guard and Air Force National Guard.

Methods

The surveillance population included all individuals eligible for HIV antibody screening from January 1, 2018 through June 30, 2023 while serving in the active or reserve component of the Army, Navy, Air Force, Marine Corps, or Coast Guard. All individuals who were tested and all first-time detections of antibodies to HIV through U.S. military medical testing programs were ascertained from the Department of Defense Serum Repository (DoDSR) specimens accessioned to the Defense Medical Surveillance System (DMSS). Due to data availability issues, the Navy and Marine Corps new HIV seropositive numbers for 2023 were obtained by the Navy Bloodborne Infection Management Center from the Navy's HIV Management System (HMS).

An incident case of HIV-antibody seropositivity was defined as an individual with positive HIV test results from 2 serial specimens. Individuals who had just 1 positive result without a subsequent negative result were also defined as positive, to capture those who had yet to test positive a second time.

Annual rates of HIV seropositivity among service members were calculated by dividing the number of incident cases of HIV-antibody seropositivity during each calendar year by the number of individuals tested at least once during the relevant calendar year. Rates were further stratified by service, component, and sex. Overall rates by age category were calculated for all services for the full annual years of 2018 through 2022.

Results

Overall

From January 2018 through June 2023, approximately 7 million service members (active component, Guard, and reserve) were tested for antibodies to HIV, and 1,502 were identified as HIV-antibody positive (seropositivity: 0.21 per 1,000 tested) **(data not shown)**. The rate among males (0.25 per 1,000 tested) persisted above females (0.03 per 1,000 tested) throughout the surveillance period, as only 39 females were identified as newly HIV antibody-positive during this time. Age-specific HIV seropositivity rates are presented for complete annual years in **Figure 1**; service members 25 to 34 years of age represented the highest age-specific rates from 2018 to 2022.

U.S. Army

Active component: From January 2022 through June 2023, a total of 444,341 soldiers in the active component of the U.S. Army were tested for antibodies to HIV, and 106 soldiers were identified as HIV-antibody positive (seropositivity: 0.24 per 1,000 soldiers tested) **(Table 1)**. During the surveillance period, annual seropositivity rates fluctuated between a low of 0.19 per 1,000 tested in 2018 and a high of 0.28 per 1,000 tested in 2021 **(Table 1, Figure 2)**. Annual seropositivity rates for male active component soldiers were considerably higher than those of female active component soldiers **(Figure 2)**. During 2022, on average, 1 new HIV infection was detected among active component soldiers per 4,924 screening tests **(Table 1)**. Of the 405 active component soldiers diagnosed with HIV infections since 2018, a total of 259 (63.9%) were still in military service in 2023.

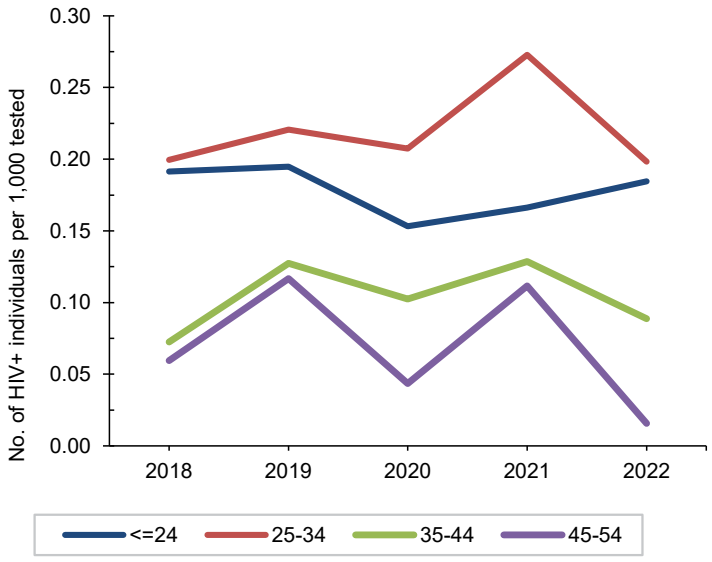
Army National Guard: From January 2022 through June 2023, a total of 259,873 members of the U.S. Army National Guard were tested for antibodies to HIV, and 63 soldiers were identified as HIV-antibody positive (seropositivity: 0.24 per 1,000 soldiers tested) **(Table 2)**. On average, during 2022, 1 new HIV infection was detected among Army National Guard soldiers per 5,189 screening tests. Of the 284 National Guard soldiers who tested positive for HIV since 2018, a total of 187 (65.8%) were still in military service in 2023.

Army Reserve: From January 2022 through June 2023, a total of 119,195 members of the U.S. Army Reserve were tested for antibodies to HIV, and 46 soldiers were identified as HIV-antibody positive (seropositivity: 0.39 per 1,000 soldiers tested) **(Table 3)**. During 2022, on average, 1 new HIV infection was detected among Army reservists per 3,025 screening tests. Of the 180 Army reservists diagnosed with HIV infections since 2018, a total of 114 (63.3%) were still in military service in 2023.

U.S. Navy

Active component: From January 2022 through June 2023, a total of 294,801 active component members of the U.S. Navy were tested for antibodies to HIV, and 53 sailors were identified as HIV-antibody positive (seropositivity: 0.18 per 1,000 sailors tested) **(Table 4)**. During 2022, on average, 1 new HIV infection was detected among active component sailors per 7,306.6 screening tests. Of the 240 active component sailors who tested positive for HIV since 2018, a total of 161 (67.1%) were still in military service in 2023. During each year of the surveillance period, only 0 to 3 female sailors tested positive. Among male sailors, the rate per 1,000 tested fluctuated between 0.20 to 0.30 from 2018 through 2022 **(Figure 3)**.

FIGURE 1. HIV-antibody seropositivity rates by age[a], U.S. Armed Forces,[b] January 2018–2022



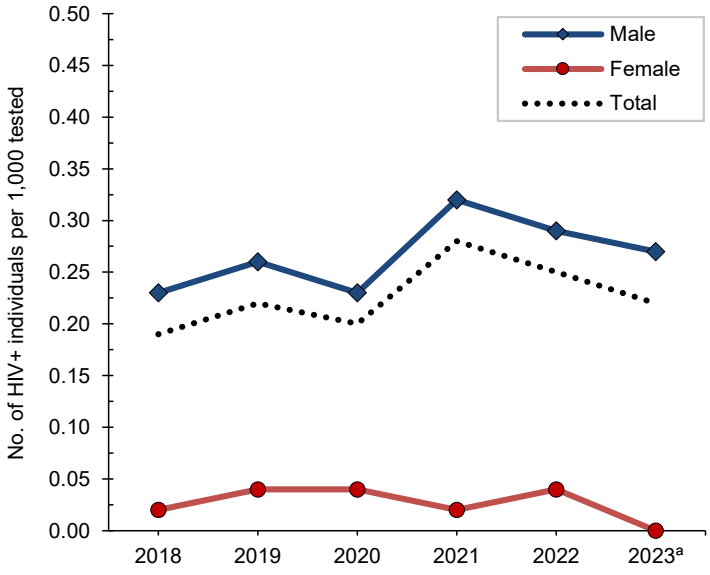
[a] Rates are not represented for service members ages 55 and older due to rate instability, as only 3 service members of this age group were identified as HIV seropositive 2018-2022.
[b] Includes all components (active, reserve, guard) for service members of the Army, Navy, Air Force, Marine Corps and Coast Guard.

TABLE 1. New diagnoses of HIV infections, by sex, active component, U.S. Army, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	450,644	351,365	296,765	54,600	68	67	1	0.19	0.23	0.02	25
2019	439,658	345,692	289,761	55,931	77	75	2	0.22	0.26	0.04	35
2020	398,366	322,381	270,021	52,360	65	63	2	0.20	0.23	0.04	40
2021	403,694	323,491	270,866	52,625	89	88	1	0.28	0.32	0.02	61
2022	364,392	299,632	250,890	48,742	74	72	2	0.25	0.29	0.04	66
2023[a]	154,238	144,709	120,711	23,998	32	32	0	0.22	0.27	0.00	32
Total	2,210,992	1,787,270	1,499,014	288,256	405	397	8	0.23	0.26	0.03	259

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

FIGURE 2. HIV-antibody seropositivity rates by sex, active component, U.S. Army, January 2018–June 2023



Abbreviations: HIV, human immunodeficiency virus; No., number.
[a]Through June 30, 2023.

Navy Reserve: From January 2022 through June 2023, a total of 45,135 members of the U.S. Navy Reserve were tested for antibodies to HIV, and 7 sailors were identified as HIV-antibody positive (seropositivity: 0.16 per 1,000 sailors tested) **(Table 5)**. On average, during 2022, 1 new HIV infection was detected among Navy reservists per 5,373.8 screening tests. Of the 43 reserve component sailors diagnosed with HIV infections since 2018, a total of 35 (81.4%) were still in military service in 2023. The HIV-antibody seropositivity rate declined from 0.21 per 1,000 Navy reservists in 2022 to 0.06 as of June 2023.

U.S. Air Force

Active component: From January 2022 through June 2023, a total of 286,900 active component members of the U.S. Air Force were tested for antibodies to HIV, and 43 Air Force members were diagnosed with HIV infection (seropositivity: 0.15 per 1,000 Air Force members tested) **(Table 6)**. On average, 1 new HIV infection was detected among active component Air Force members per 7,461 screening tests in 2022. Of the 151 active component Air Force members diagnosed with HIV infections since 2018, 101 (66.9%) were still in military service in 2023. During the surveillance period, seropositivity rates among male members ranged from a low of 0.11 per 1,000 tested in 2020 to a high of 0.22 per 1,000 tested in 2022 **(Figure 4)**.

Air National Guard: From January 2022 through June 2023, a total of 81,626 members of the Air National Guard were tested for antibodies to HIV, and 7 Air National Guard members were diagnosed with HIV infection (seropositivity: 0.09 per 1,000 airmen tested) **(Table 7)**. During 2022, on average, 1 new HIV infection was detected among Air National Guard members per 15,343 screening tests. Of the 32 Air National Guard members diagnosed with HIV infections since 2018, 27 (84.4%) were still in military service in 2023.

Air Force Reserve: From January 2022 through June 2023, a total of 50,556 members of the Air Force Reserve were tested for antibodies to HIV, and 4 Air Force reservists were diagnosed with HIV infections (seropositivity: 0.08 per 1,000 airmen tested) **(Table 8)**. During 2022, on average, 1 new HIV infection was detected among Air Force reservists per 9,321 screening

TABLE 2. New diagnoses of HIV infections, by sex, U.S. Army National Guard, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	235,464	205,430	168,531	36,899	50	49	1	0.24	0.29	0.03	19
2019	235,062	202,960	165,337	37,623	60	60	0	0.30	0.36	0.00	30
2020	215,735	189,970	153,428	36,542	61	58	3	0.32	0.38	0.08	38
2021	218,089	190,148	154,020	36,128	50	48	2	0.26	0.31	0.06	39
2022	202,727	174,540	140,549	33,991	39	36	3	0.22	0.26	0.09	37
2023[a]	88,274	85,333	69,387	15,946	24	23	1	0.28	0.33	0.06	24
Total	1,195,351	1,048,381	851,252	197,129	284	274	10	0.27	0.32	0.05	187

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 3. New diagnoses of HIV infections, by sex, U.S. Army Reserve, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	122,466	105,996	79,887	26,109	39	37	2	0.37	0.46	0.08	15
2019	125,891	109,316	81,954	27,362	42	40	2	0.38	0.49	0.07	25
2020	115,402	101,157	75,258	25,899	24	23	1	0.24	0.31	0.04	14
2021	119,126	101,450	75,578	25,872	29	29	0	0.29	0.38	0.00	21
2022	102,853	89,209	66,197	23,012	34	34	0	0.38	0.51	0.00	28
2023[a]	31,183	29,986	22,212	7,774	12	12	0	0.40	0.54	0.00	11
Total	616,921	537,114	401,086	136,028	180	175	5	0.34	0.44	0.04	114

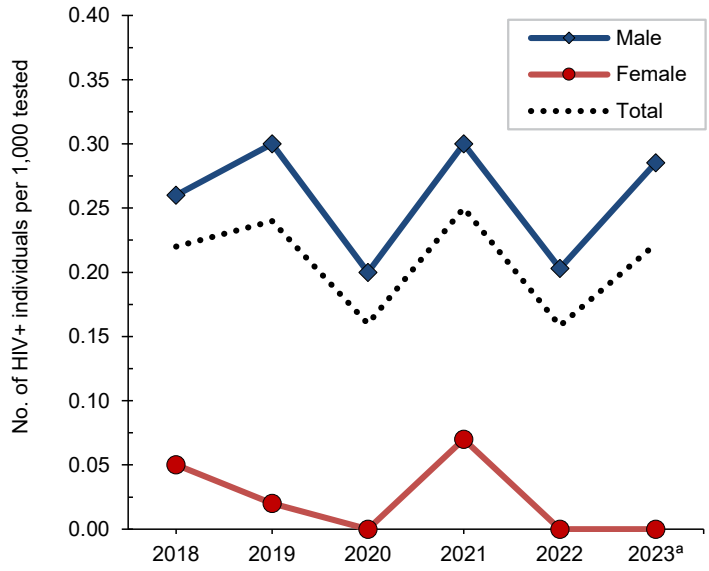
Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 4. New diagnoses of HIV infections, by sex, active component, U.S. Navy, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	252,553	216,851	172,703	44,148	47	45	2	0.22	0.26	0.05	20
2019	258,388	223,012	176,054	46,958	54	53	1	0.24	0.30	0.02	32
2020	224,634	199,514	156,103	43,411	32	32	0	0.16	0.20	0	20
2021	242,452	215,092	169,000	46,092	54	51	3	0.25	0.30	0.07	39
2022	226,505	195,729	152,753	42,976	31	31	0	0.16	0.20	0.00	29
2023[a]	110,982	99,072	77,082	21,990	22	22	0	0.22	0.29	0.00	21
Total	1,315,514	1,149,270	903,695	245,575	240	234	6	0.21	0.26	0.02	161

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

FIGURE 3. HIV-antibody seropositivity rates by sex, active component, U.S. Navy, January 2018–June 2023



Abbreviations: HIV, human immunodeficiency virus; No., number.
[a] Through June 30, 2023.

tests. Of the 36 Air Force reservists diagnosed with HIV infections since 2018, 28 (77.8%) were still in military service in 2023.

U.S. Marine Corps

Active component: From January 2022 through June 2023, a total of 166,411 members of the active component of the U.S. Marine Corps were tested for antibodies to HIV, and 24 Marines were identified as HIV-antibody positive (seropositivity: 0.14 per 1,000 Marines tested) **(Table 9)**. During 2022, on average, 1 new HIV infection was detected among active component Marines per 10,790 screening tests. Of the 106 active component marines diagnosed with HIV infections since 2018, a total of 47 (44.3%) were still in military service

TABLE 5. New diagnoses of HIV infections, by sex, U.S. Navy Reserve, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	37,854	33,384	25,750	7,634	10	10	0	0.3	0.39	0	8
2019	38,728	34,390	26,479	7,911	9	9	0	0.26	0.34	0	7
2020	30,254	27,849	21,143	6,706	6	6	0	0.22	0.28	0	5
2021	36,508	33,193	25,051	8,142	11	9	2	0.33	0.36	0.25	8
2022	32,243	28,770	21,586	7,184	6	5	1	0.21	0.23	0.14	6
2023[a]	17,230	16,365	12,252	4,113	1	1	0	0.06	0.08	0.00	1
Total	192,817	173,951	132,261	41,690	43	40	3	0.25	0.30	0.07	35

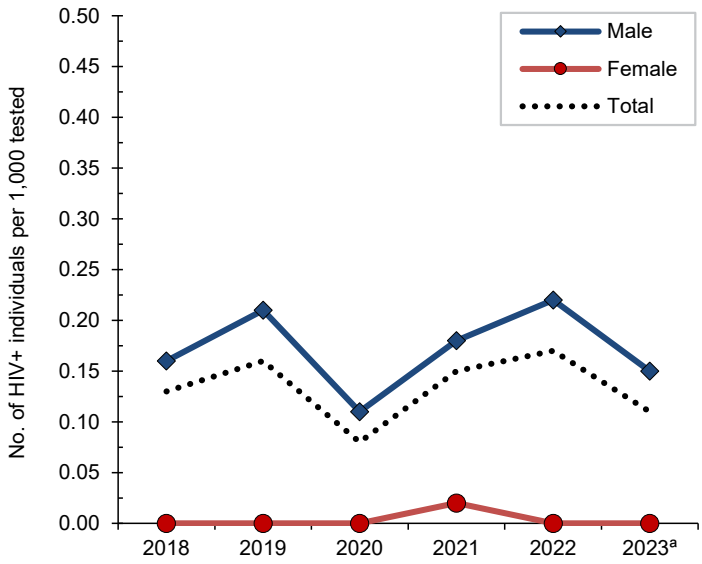
Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 6. New diagnoses of HIV infections, by sex, active component, U.S. Air Force, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	258,660	207,699	164,659	43,040	27	27	0	0.13	0.16	0	11
2019	262,908	209,418	164,468	44,950	34	34	0	0.16	0.21	0	20
2020	243,730	194,492	152,338	42,154	16	16	0	0.08	0.11	0	11
2021	256,776	208,356	162,334	46,022	31	30	1	0.15	0.18	0.02	19
2022	238,741	190,580	148,686	41,894	32	32	0	0.17	0.22	0	29
2023[a]	107,977	96,320	75,089	21,231	11	11	0	0.11	0.15	0	11
Total	1,368,792	1,106,865	867,574	239,291	151	150	1	0.14	0.17	0.00	101

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

FIGURE 4. HIV-antibody seropositivity rates by sex, active component, U.S. Air Force, January 2018–June 2023



Abbreviations: HIV, human immunodeficiency virus; No., number.
[a] Through June 30, 2023.

in 2023. Among males, the rate per 1,000 declined from 0.22 per 1,000 tested in 2018 to 0.11 per 1,000 tested in 2022, thereafter increasing to a rate of 0.25 per 1,000 tested as of June 2023 **(Figure 5)**.

Marine Corps Reserve: From January 2022 through June 2023, a total of 28,444 members of the U.S. Marine Corps Reserve were tested for antibodies to HIV, and 3 Marine Corps reservists were identified as HIV-antibody positive (seropositivity: 0.11 per 1,000 Marines tested) **(Table 10)**. During 2022, on average, 1 new HIV infection was detected among Marine Corps reservists per 9,983.5 screening tests. Of the 17 Marine Corps reservists diagnosed with HIV infection since 2018, a total of 6 (35.3%) were still in military service in 2023.

TABLE 7. New diagnoses of HIV infections, by sex, U.S. Air National Guard, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	71,242	61,314	48,878	12,436	4	4	0	0.07	0.08	0	3
2019	67,339	58,867	46,277	12,590	7	7	0	0.12	0.15	0	4
2020	67,957	58,982	46,181	12,801	6	5	1	0.1	0.11	0.08	5
2021	68,123	60,320	47,174	13,146	8	8	0	0.13	0.17	0	8
2022	61,371	54,839	42,803	12,036	4	3	1	0.07	0.07	0.08	4
2023[a]	28,014	26,787	21,094	5,693	3	3	0	0.11	0.14	0	3
Total	364,046	321,109	252,407	68,702	32	30	2	0.10	0.12	0.03	27

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 8. New diagnoses of HIV infections, by sex, U.S. Air Force Reserve, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	41,397	36,813	26,973	9,840	4	4	0	0.11	0.15	0	1
2019	42,220	37,056	26,860	10,196	7	7	0	0.19	0.26	0	5
2020	38,952	33,955	24,611	9,344	6	6	0	0.18	0.24	0	4
2021	41,604	37,443	27,032	10,411	15	14	1	0.4	0.52	0.1	14
2022	37,282	33,467	24,192	9,275	4	4	0	0.12	0.17	0	4
2023[a]	17,955	17,089	12,391	4,698	0	0	0	0	0	0	0
Total	219,410	195,823	142,059	53,764	36	35	1	0.18	0.25	0.02	28

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 9. New diagnoses of HIV infections, by sex, active component, U.S. Marine Corps, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	157,616	135,993	123,714	12,279	27	27	0	0.2	0.22	0	6
2019	160,070	138,213	125,686	12,527	21	20	1	0.15	0.16	0.08	3
2020	140,682	123,775	112,648	11,127	19	19	0	0.15	0.17	0	8
2021	148,046	129,775	117,798	11,977	15	15	0	0.12	0.13	0	9
2022	129,478	112,855	101,862	10,993	12	11	1	0.11	0.11	0.09	9
2023[a]	57,723	53,556	48,036	5,520	12	12	0	0.22	0.25	0.00	12
Total	793,615	694,167	629,744	64,423	106	104	2	0.15	0.17	0.03	47

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 10. New diagnoses of HIV infections, by sex, U.S. Marine Corps Reserve, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	27,002	22,982	22,210	772	4	4	0	0.17	0.18	0	0
2019	28,200	24,835	23,933	902	3	3	0	0.12	0.13	0	1
2020	19,371	17,874	17,140	734	2	2	0	0.11	0.12	0	1
2021	26,095	22,700	21,841	859	5	5	0	0.22	0.23	0	2
2022	19,967	17,749	17,025	724	2	2	0	0.11	0.12	0	1
2023[a]	11,190	10,695	10,208	487	1	1	0	0.09	0.10	0.00	1
Total	131,825	116,835	112,357	4,478	17	17	0	0.15	0.15	0.00	6

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 11. New diagnoses of HIV infections, by sex, active component, U.S. Coast Guard, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	22,051	21,120	17,980	3,140	2	1	1	0.09	0.06	0.32	0
2019	21,224	20,347	17,198	3,149	2	2	0	0.1	0.12	0	0
2020	17,274	16,753	14,137	2,616	1	1	0	0.06	0.07	0	1
2021	20,465	19,802	16,636	3,166	1	1	0	0.05	0.06	0	1
2022	19,580	18,935	15,931	3,004	0	0	0	0	0	0	0
2023[a]	9,115	8,961	7,485	1,476	0	0	0	0	0	0	0
Total	109,709	105,918	89,367	16,551	6	5	1	0.06	0.06	0.06	2

Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

TABLE 12. New diagnoses of HIV infections, by sex, U.S. Coast Guard Reserve, January 2018–June 2023

Year	Total HIV tests	Total persons tested	Males tested	Females tested	Total new HIV(+)	New HIV(+) male	New HIV(+) female	Overall rate per 1,000 tested	Male rate per 1,000 tested	Female rate per 1,000 tested	HIV(+) still in military service in 2023
2018	3,991	3,728	3,076	652	0	0	0	0	0	0	0
2019	2,617	2,471	2,069	402	1	1	0	0.4	0.48	0	0
2020	2,846	2,756	2,284	472	1	1	0	0.36	0.44	0	1
2021	3,234	3,028	2,514	514	0	0	0	0	0	0	0
2022	2,918	2,826	2,333	493	0	0	0	0	0	0	0
2023[a]	1,543	1,528	1,254	274	0	0	0	0	0	0	0
Total	17,149	16,337	13,530	2,807	2	2	0	0.12	0.15	0.00	1

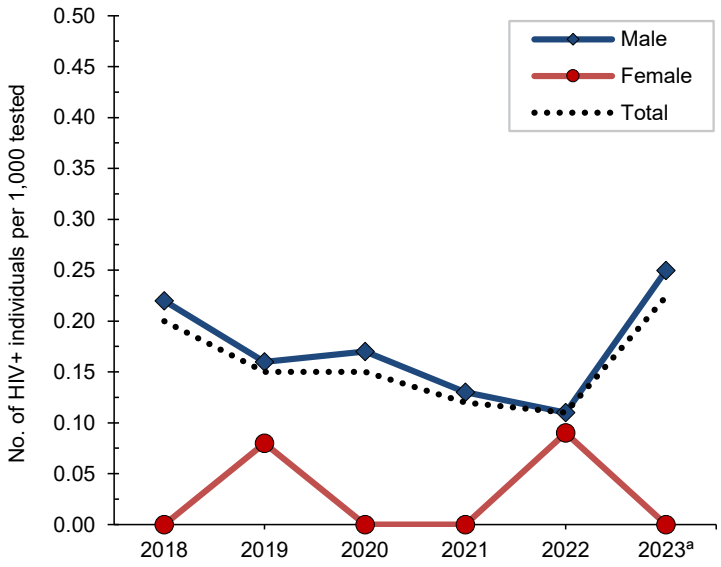
Abbreviation: HIV, human immunodeficiency virus.
[a]Through June 30, 2023.

U.S. Coast Guard

Active component: From January 2022 through June 2023, a total of 27,896 members of the active component of the U.S. Coast Guard were tested for antibodies to HIV; 0 were identified as HIV-antibody positive **(Table 11)**. Of the 6 active component Coast Guardsmen diagnosed with HIV infections since 2018, a total of 2 (33.3%) were still in military service in 2023.

Coast Guard Reserve: From January 2022 through June 2023, a total of 4,354 members of the U.S. Coast Guard Reserve were tested for antibodies to HIV; 0 Coast Guard reservists were identified as HIV-antibody positive **(Table 12)**.

FIGURE 5. HIV-antibody seropositivity rates by sex, active component, U.S. Marine Corps, January 2018–June 2023



Abbreviations: HIV, human immunodeficiency virus; No., number.
[a] Through June 30, 2023.

Discussion

The U.S. military has conducted routine screening for antibodies to HIV among all civilian applicants for service and all service members for more than 30 years.[3-6] Results of U.S. military HIV-antibody testing programs have been summarized in the *MSMR* for more than 2 decades.[7] This year marks the returned inclusion of HIV screening for active and reserve component service members of the U.S. Coast Guard, to include summary data for 5 services of the U.S. Armed Forces.

This report documents that the full-year HIV-antibody seropositivity rate in 2022 among Army active component service members (0.25 per 1,000 soldiers tested) remained greater than among active component members of the Air Force (0.17 per 1,000 airmen tested), Navy (0.16 per 1,000 sailors tested), Coast Guard (0 per 1,000 Coast Guardsmen tested), and Marine Corps (0.11 per 1,000 Marines tested). In comparison to 2022, the mid-year HIV seropositivity rates as of June 2023 declined for active component service members of the Army and Air Force but increased for the Navy and Marine Corps.

The 2022-2025 National HIV/AIDS strategy identifies youth aged 13-24 years as a priority population, based on increased risk for HIV transmission.[8] While the seropositivity results presented in this report do partially represent this priority population, as almost 45% of all new HIV infections were identified in service members under 25 years of age, these results should not be generalized to the U.S. population. Data from HIV screening in U.S. military populations are based on a negative test prior to entry, as well as voluntary service.

In countries with universal conscription, compulsory testing in samples of military recruits will be more representative of the young adult population.[9] Following pre-accession screening of military recruits, routine screening represents relatively recently acquired HIV infections (i.e., infections acquired since the most recent negative test of each affected individual).

Routine screening of all civilian applicants for service and routine periodic testing of all active and reserve component members of the services have been fundamental components of the military's HIV control and clinical management efforts.[10] Previous *MSMR* reports presented HIV screening results for civilian applicants to the military service; however, these data are no longer available in the Defense Medical Surveillance System (DMSS), as the U.S. Military Entrance Processing Command stopped reporting data to the DMSS at the end of calendar year 2020. Thus, the data presented in this report reflect service members who had a negative HIV test upon entry to military service, followed by a positive test during uniformed service.

The mid-year 2023 HIV seropositive results for Navy and Marine Corps service members were obtained by the Navy Bloodborne Infection Management Center from the Navy's HIV Management System. Due to changes in data processing, positive specimens are no longer accessioned in DoDSR, although non-positive HIV samples remain documented in DoDSR and accessioned through DMSS. Consequently, the total number of positive HIV tests were acquired from DMSS to calculate seropositivity rates. The total number of HIV tests completed as of June 2023 for Navy and Marine Corps active component service members approximated half of the tests completed during 2022.

The substantial declines in detection rates associated with routine screening for Army and Air Force service members should be more fully investigated at the end of 2023. If post-accession detection rates continue to decline through routine screening of the full military force, a cost-effectiveness analysis of universal versus indications-based testing after military enlistment may be warranted. Additionally, future studies should fully describe seropositivity rates by age and race, to further elucidate trends for the most at-risk populations. Health-seeking behaviors and co-morbidities should also be evaluated to identify those at highest risk for HIV infection.

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Low Risk for Ross River Virus Infection in Expeditionary Forces Training in Australia Demonstrated by a Serological Survey of Marine Rotational Force–Darwin, 2012-2018

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On an annual basis, approximately 2,500 U.S. Marines and Sailors deploy to Australia on 6-month training rotations. Active duty personnel are generally immunologically naïve to pathogens endemic to tropical Australia, a vulnerability that could significantly impact medical readiness. To estimate risk, we screened 628 post-deployment serum samples by ELISA for serological evidence of infection with Ross River virus (RRV), a mosquito-borne alphavirus endemic to tropical Australia. Samples that tested above the negative cutoff value were paired with their pre-deployment samples to identify deployment-related seroconversion. These paired samples were further investigated with a live virus neutralization assay to assess specificity. There was a single RRV seroconversion and 49 false-positive results. In the context of these analyses (i.e., limited sample numbers collected between the months of March and October), we assess the RRV risk to MRFD as low and encourage strategies such as avoiding and preventing mosquito bites to mitigate the existing risk over widespread vaccination programs, if an FDA-approved vaccine becomes available. The Panbio RRV ELISA lacks the specificity to draw conclusions based on seropositivity from large-scale surveys of U.S. personnel.

What are the new findings?

To our knowledge, this is the first study that examines the rates of seropositivity for Ross River virus in a naïve U.S. Military population prior to an outbreak event. We identified a single seroconversion out of 628 deployers tested.

What is the impact on readiness and force health protection?

Our results, combined with the lack of Ross River virus diagnoses over 11 Marine Rotational Force–Darwin (MRFD) rotations, suggest that the current risk to MRFD for Ross River virus infection is low. Strategies such as avoiding and preventing mosquito bites will mitigate the existing risks. These low-cost strategies present a more favorable risk-benefit profile than a widespread vaccination program should an FDA-approved vaccine become available.

Each year, approximately 2,500 U.S. Marines deploy to Australia's Northern Territory to participate in joint training exercises with the Australian Defence Force, where they will potentially be exposed to a variety of bacterial and viral illnesses not normally encountered by U.S. citizens. Vector-borne illnesses caused by arboviruses such as Ross River virus (RRV) are common in Australia, including the tropical "Top End." While not fatal, RRV virus may be characterized by severe symptoms that can last as long as 6 weeks and has the potential to pose a serious threat to force readiness.

In 2012, U.S. Marines began annual deployments to Darwin, Australia to participate in joint training exercises with the Australian Defence Force and other regional partners.[1] While the main body of Marine Rotational Force–Darwin (MRFD) is based in and around Australia's "Top End" **(Figure 1, starred)**, the east coast of Queensland is also home to an entire company of Marines and numerous training areas **(Figure 1, QLD)**. While living and training in these areas, U.S. personnel have the potential to encounter a variety of infectious threats not normally encountered by Americans. *Burkholderia pseudomallei,* for example, is a soil-dwelling bacterial pathogen with a well-documented military relevance.[2-8] Vector-borne viruses also have the potential to impact the medical readiness of Marines serving in Australia.

RRV is a mosquito-borne alphavirus unique to Australia and the surrounding islands in the South Pacific and is the most prevalent vector-borne disease in Australia. More similar to Chikungunya virus than Zika, RRV disease is often asymptomatic but is also characterized by fever, malaise, headache, and joint pain. Most individuals recover in a matter of weeks, but pain and temporary disability may last for 3 to 6 months.[9-12] While not fatal, RRV disease has the potential to have a significant impact on medical readiness of U.S. personnel in Australia.[13,14]

Over 20,000 cases of RRV disease were reported in Australia during the 2014-2015 season. This represents an annual rate of 42.4 per 100,000 population, more than double the 5-year mean of 21 per 100,000. The greatest number of cases (6,371) were reported in Queensland, while the Darwin area reported an infection rate of 396 per 100,000.[10,15] While the risk of RRV infection in visitors to Australia is generally considered low, the rising incidence of RRV disease within MRFD training areas,

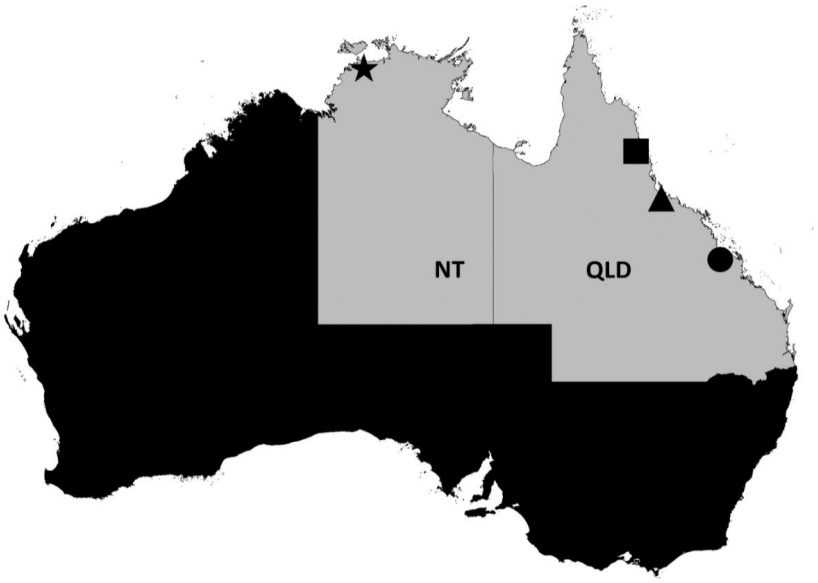
combined with immunological naïveté of American personnel, suggests a heightened RRV outbreak potential among U.S. expeditionary forces serving in Australia. In fact, the barracks and training areas along the east coast **(Figure 1)** have produced RRV outbreaks in Australian Defence Force soldiers and partners.[12,14,16] Of note, a joint training exercise in 1997 resulted in at least 8 RRV infections among approximately 9,000 U.S. Marines and Australian Soldiers who had participated in ground exercises in the Shoal Water Bay training area.[13,16] The outbreak in 1997 remains the only documented assessment of RRV infection in U.S. expeditionary forces and was generally consistent with the rates of infection for the population of Queensland.[12] The purpose of this study was to ascertain the risk of RRV to MRFD and assess the need for rotational pre-exposure prophylaxis to maintain a medically-ready force.

Materials and Methods

Human Specimens

This study was approved by the Naval Medical Research Command Institutional Review Board. As part of a previous study of U.S. Marines deployed to Australia, 1,124 de-identified serum samples were obtained from the Department of Defense Serum Repository (DoDSR), as well as basic demographic data including serum collection dates, sex, military occupational specialty (MOS), and deployment history.[17,18] For this study, a convenience sample of serum specimens from Marines who deployed to Australia during MRFD rotations between 2012 and 2014 was acquired from 284 individuals with no prior deployment history whatsoever (n=254) or no prior deployments to Australia (n=30). Additional serum samples were collected as part of a prospective observational study of Marines who train in Australia.[1] In this study, MRFD deployers participated in pre-and post-deployment activities that included blood sample collection. Additional information including demographics, deployment history, MOS, and training area was self-reported via a study questionnaire. While the previous study was designed to assess the risks of *B. pseudomallei* to MRFD, all participants selected for this study provided written informed consent for additional testing related to their training in Australia. Serum samples from 344 individuals who participated in MRFD rotations between 2016 and 2018, whose time in Australia included living and/or training in the east coast areas of Australia, were selected for RRV testing. Demographic characteristics of both cohorts are provided in **Table 1**.

FIGURE 1. Map of Australia with Relevant Training Areas Highlighted



Abbreviations: NT, Northern Territory; QLD, Queensland. Circle, Shoal Water Bay; Square, Tully; Star, Darwin; Triangle, Townsville

Serology

ELISA

Panbio Ross River Virus IgG ELISA kits (Cat# SD04PE11) were obtained from Alere (QLD 4169, Australia). Post-deployment samples were first screened according to the manufacturer's instructions. A manufacturer-provided algorithm combines data produced by a series of controls into a lot-specific assay cut-off value that is used to convert specimen absorbance measurements into "Panbio Units." Measurements below 9 Panbio Units indicate RRV-negative, above 11 indicate RRV-positive, while values between 9 and 11 are equivocal, requiring a retest. Samples producing over 9 Panbio units in the screen were paired with their pre-deployment sera and reassessed further using the same methods.

Micro-Neutralization Assay (MNA)

Serum neutralizing antibodies (Nab) directed against RRV (RRV QML strain, Genbank No. GQ433354), Barmah Forest virus (BFV) (BH2193, GenBank No. NC_001786), or Chikungunya virus (a CHIKV Reunion strain, GenBank No. DQ443544), were assessed using a microneutralization assay, modified according to the methods previously described.[19] Anti-BFV, anti-CHIKV, or anti-RRV-specific NAb titers ≥10 were considered positive.

Results

We first sought to identify samples with elevated antibodies to RRV by screening post-deployment sera with the Panbio RRV ELISA kit as described in the Methods. Fifty samples from the screen of 628 post-deployment samples scored above 9 Panbio units, placing them within the equivocal or positive ranges of the assay; 18 of these samples were from the DoDSR cohort **(Figure 2A)** and 32 samples were from the prospective cohort **(Figure 2B)**. Each of these samples was then paired

TABLE 1. Cohort Demographics and Military Characteristics, by Source

	DoDSR	Prospective	Total
Total	284	344	628
Gender			
Male	281	340	621
Female	3	2	5
Unknown	0	2	2
Racial/ethnic group			
Non-Hispanic White	210	199	409
Hispanic	39	85	124
Non-Hispanic Black	18	29	47
Asian	11	12	23
Pacific Islander	3	8	11
Other	3	11	14
Rank			
Junior enlisted (E1-E3)	224	213	437
NCO (E4-E5)	40	100	140
SNCO (E6-E9)	5	14	19
Officer	15	12	27
Unknown	0	5	5
Military occupational specialty			
Infantry	178	260	438
Administration	10	8	18
Communication	36	13	49
Transportation	24	1	25
Engineer/construction/facilities	14	0	14
Medical	unk	28	28
Other	22	34	56
MRFD rotations			
2012	19	0	19
2013	96	0	96
2014	169	0	169
2016	0	121	121
2017	0	109	109
2018	0	114	114

Abbreviations: DoDSR, Department of Defense Serum Repository; NCO, non-commissioned officer; SNCO, senior non-commissioned officer; MRFD, Marine Rotational Force-Darwin; unk, unknown.

with its pre-deployment sample, and the assay was repeated to determine if the elevated titers detected in the screen were the result of a deployment-related seroconversion. Samples from the DoDSR cohort of archived specimens yielded a single individual with a potentially significant deployment-related seroconversion **(Table 2A)**, while 2 individuals from the prospectively-collected cohort exhibited potential seroconversion **(Table 2B, 59 and 63)**. Of the remaining 47 individuals with elevated post-deployment titers, further testing revealed no change from pre-deployment values. Alpha viruses such as RRV, Chikungunya virus, and Barmah Forest virus are known to produce cross-reactive antibodies potentially confounding serological analyses.[20] To confirm our results, we assessed the sera's ability to neutralize RRV in a live virus microneutralization assay (MNA) described in the Methods. The single ELISA-detected seroconversion from our DoDSR cohort was confirmed by MNA to produce an RRV-neutralizing titer (NT) of 640 **(Table 2A, subject 1044)**. Conversely, MNA data did not support either of the 2 potential seroconversions detected by ELISA in the prospective cohort. One individual from the prospective cohort was weakly positive (NT=20) for both the pre- and post-deployment samples in the RRV MNA **(Table 2B, subject 247)**. This individual also produced Chikungunya virus-neutralizing antibodies in both pre- and post-deployment sera (NT=160, each; **data not shown**). The remaining samples from both cohorts were confirmed negative by RRV MNA. No sample from either cohort neutralized Barmah Forest virus **(data not shown)**.

Discussion

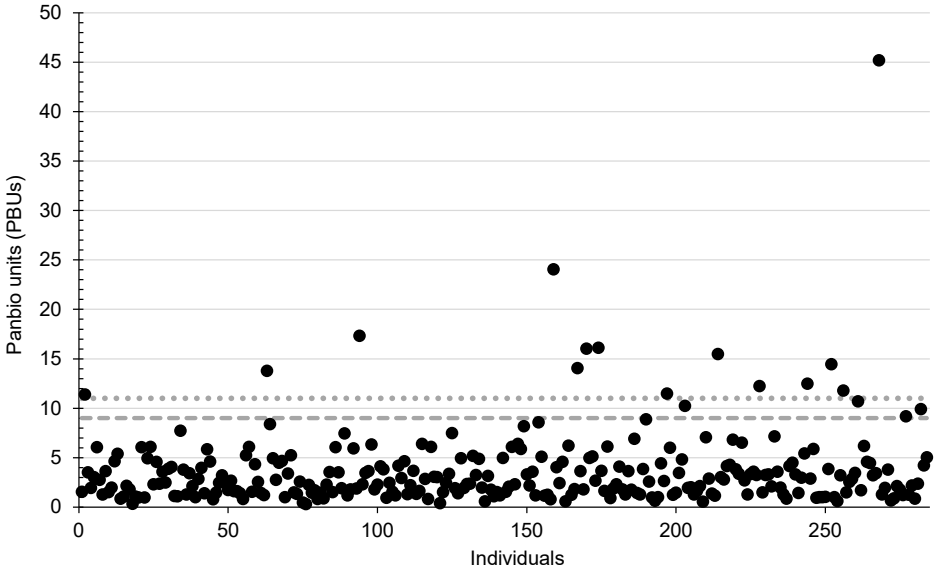
In this study, we combined archived specimens and prospectively collected samples from Marines with the goal of characterizing the risks of RRV infection to American personnel while deployed or training in tropical Australia. While not fatal, RRV poses a vector-borne outbreak threat to U.S. personnel in tropical Australia, with potential impact on MRFD medical readiness.[13,14] By combining broad screening of post-deployment samples with targeted assessment of paired, pre- and post-deployment samples, followed by live virus neutralization assays for confirmation, we were able to differentiate between deployment-related seroconversion and false-positive results.

One of the strengths of this study is the sample and demographic collection leveraged from the prospective study of Marines.[1] Study questionnaires allowed for the identification of specific training areas **(Figure 1)**, as opposed to the country-level deployment histories provided with the DoDSR specimens. The most notable limitation of this work was sample size. Each year approximately 2,500 expeditionary forces deploy to Australia, making this sample set small in comparison to the number of Marines deployed to Darwin over the years.

An important finding in this study is the apparent lack of specificity in the Panbio RRV ELISA kits. Results from approximately 8% (50/628) of post-deployment samples were either positive (n=36) or equivocal (n=14). Further examination revealed that pre-deployment sera from 36 of these individuals also tested above the assay's negative threshold. This was particularly interesting, considering that only 1 of those individuals had a travel history outside the continental U.S. When these samples were investigated with a more specific live virus neutralization assay, only 1 individual tested weakly positive (NT=20) in both pre- and post-deployment samples **(Table 2B, subject 247)**. Further investigation of these samples, however, revealed prior Chikungunya virus infection, which was previously demonstrated to elicit antibody responses that cross-react with RRV, further questioning the utility of this low-specificity ELISA assay.[20] The 14-fold increase in RRV titer observed in subject 1044 **(Table 2A)**, however, was confirmed by RRV MNA, indicating a single deployment-related seroconversion. The remaining 48 non-negative samples represent, at a minimum, 34 false-positive results (6% false-positive rate) and 14 equivocal results (rate of 2.4%). These data should urge caution when attempting to draw conclusions based on seropositivity from large-scale surveys of U.S. personnel with unproven assays and underscore the need for specific confirmatory testing of potentially positive results.

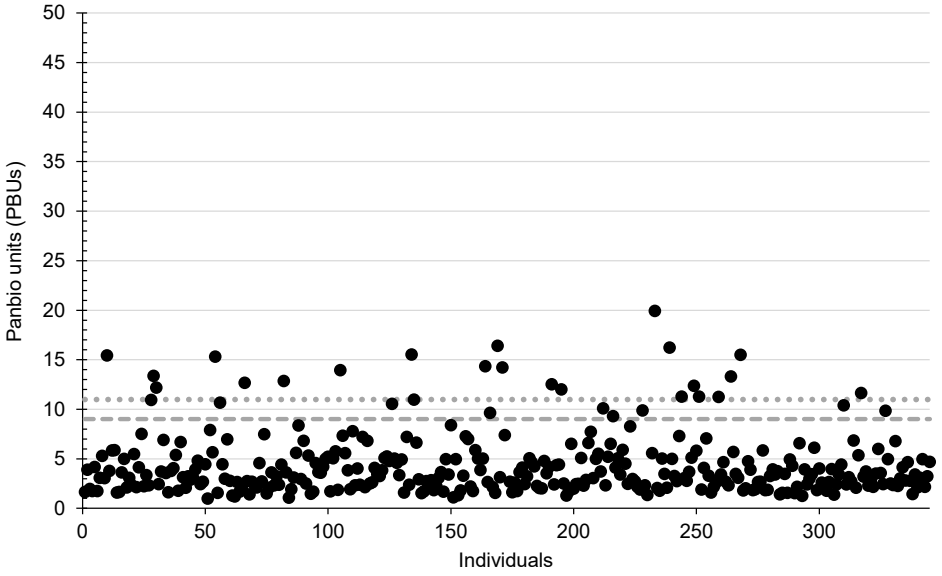
To our knowledge, this is the first study to proactively examine the rates of seropositivity for RRV in a naïve U.S. military population, and the second study of RRV in expeditionary forces overall.[13] The previous study detailed an outbreak that occurred during a joint training exercise in 1997. A combination of acute manifestation and post-exercise surveillance identified at least 8 RRV infections among the approximately 9,000 U.S. and Australian service members who participated in ground exercises around the Shoal Water Bay training area **(Figure 1)**. While this event highlights the potential impact of RRV on expeditionary forces, the exercise occurred during the rainy season and peak vector activity. Furthermore, none of the infected individuals complied with recommended personal mitigation strategies, i.e., permethrin-treated uniforms, DEET repellent, bed netting, etc. While MRFD is housed and trained in areas known to experience outbreaks, MRFD arrives in Australia in the late-March or April timeframe, and training operations occur almost exclusively during the dry season.[10] To highlight the importance of seasonality, the past 11 MRFD rotations combined vastly exceed 9,000 participants yet produced 0 RRV diagnoses, and this study identified only 1 seroconversion. These facts combine to suggest that the current risk to MRFD for large-scale RRV infection is quite low. Strategies for avoiding and preventing mosquito bites such as permethrin-treated uniforms, insect repellent, and command emphasis on their proper use should mitigate existing risks.[21,22] Meanwhile, MRFD is scheduled to return

FIGURE 2a. DoDSR Post-Deployment Screen



Note: The negative cutoff value (9 PBUs) and the positive cutoff value (11 PBUs) are indicated with dashed and dotted lines (respectively). The intervening values are considered equivocal.

FIGURE 2b. Prospective Post-Deployment Screen



Note: The negative cutoff value (9 PBUs) and the positive cutoff value (11 PBUs) are indicated with dashed and dotted lines (respectively). The intervening values are considered equivocal.

TABLE 2a. Seroconversion Assessment, DoDSR Cohort

Sample ID	Pre-deployment	Post-deployment	Fold change	MNA titer
0003	8.57	11.38	1.33	0
0167	11.41	13.79	1.21	0
0274	9.78	17.33	1.77	0
0547	20.01	24.03	1.20	0
0582	19.87	14.04	0.71	0
0592	12.18	16.00	1.31	0
0606	13.28	16.11	1.21	0
0711	10.31	11.47	1.11	0
0739	10.30	10.23	0.99	0
0809	12.40	15.47	1.25	0
0873	11.83	12.22	1.03	0
0961	10.09	12.48	1.24	0
0998	17.27	14.43	0.84	0
1006	6.86	11.79	1.72	0
1020	9.19	10.70	1.16	0
1044	3.21	45.16	**14.06**	**640**
1089	8.07	9.19	1.14	0
1102	12.32	9.90	0.80	0

Abbreviation: MNA, micro-neutralization assay.
Note: Each post-deployment DoDSR cohort sample testing positive or equivocal (i.e., ≥9 PBUs) was paired with its pre-deployment sample and retested. The fold change in pre- to post-deployment titer is presented, as well as the MNA titer for each post-deployment sample.

TABLE 2b. Seroconversion Assessment, Prospective Cohort

Sample ID	Pre-deployment	Post-deployment	Fold change	MNA titer
142	15.59	15.43	0.99	0
195	7.62	10.94	1.43	0
196	15.69	13.38	0.85	0
197	12.69	12.17	0.96	0
247	20.70	15.32	0.74	**20**
249	8.77	10.68	1.22	0
262	10.41	12.66	1.22	0
280	10.20	12.85	1.26	0
303	13.64	13.94	1.02	0
17	11.30	10.53	0.93	0
25	16.50	15.52	0.94	0
26	12.58	10.97	0.87	0
57	9.50	14.34	1.51	0
59	1.90	9.62	**5.06**	0
63	6.01	16.40	**2.73**	0
66	15.84	14.22	0.90	0
91	12.33	12.51	1.01	0
95	6.22	12.00	1.93	0
112	7.12	10.08	1.42	0
116	5.73	9.31	1.62	0
128	8.95	9.87	1.10	0
309	20.47	19.91	0.97	0
317	16.48	16.23	0.98	0
325	8.18	11.29	1.38	0
331	15.05	12.37	0.82	0
333	13.04	11.27	0.86	0
342	7.34	11.24	1.53	0
347	12.27	13.30	1.08	0
352	12.24	15.49	1.27	0
399	10.20	10.40	1.02	0
407	13.00	11.63	0.89	0
420	9.11	9.85	1.08	0

Abbreviation: MNA, micro-neutralization assay.
Note: Each prospective cohort post-deployment sample that tested positive or equivocal (≥9 PBUs) was paired with its pre-deployment sample and retested. The pre- to post-deployment titer fold change is listed, as well as the MNA titer for each post-deployment sample.

to Australia for decades to come and may include a year-round presence. The MRFD force health protection posture will likely change during that time. Medical leadership should continue to monitor MRFD personnel for infectious agents uniquely endemic to Australia and keep these infections in mind when clinical presentations warrant.

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The study protocols were approved by the Institutional Review Boards of the Naval Medical Research Command in compliance with all applicable U.S. Federal regulations governing the protection of human subjects.
The views expressed in this article reflect the results of research conducted by the authors and do not necessarily reflect the official policy nor position of the Department of the Navy, Department of Defense, or the United States or Australian governments.

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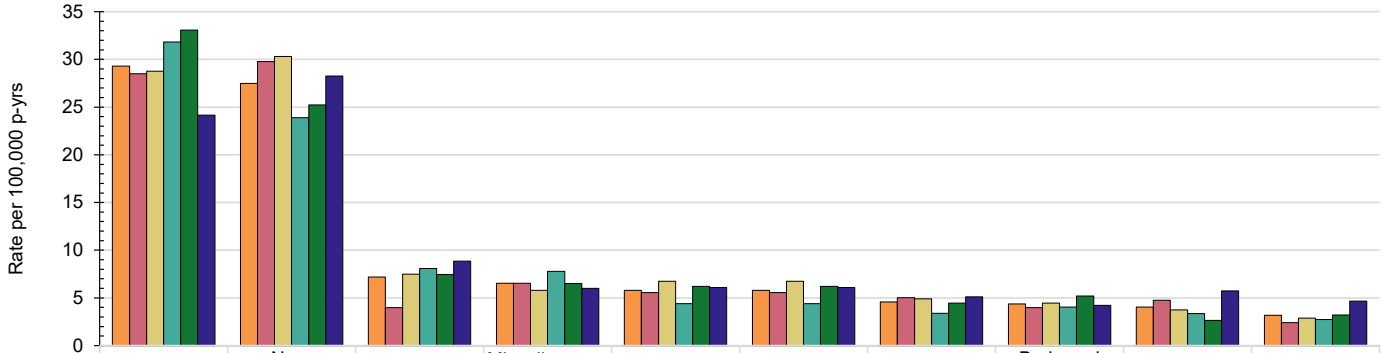
Surveillance Snapshot: The Top 10 Incident Cancers Among Active Component Service Members, 2018-2022

Sithembile Mabila, PhD; Erika Dreyer, MPH

FIGURE. Incidence Rates of the 10 Leading Cancers[a] Among Active Component Service Members, U.S. Armed Forces, 2018-2022



	Female breast	Non-melanoma skin cancer	Testis	Miscellaneous malignant cancer[b]	Thyroid	Melanoma of the skin	Non-Hodgkin lymphoma	Brain and other nervous system	Prostate	Colon and rectum
Overall	29.3	27.5	7.2	6.5	5.8	5.8	4.6	4.4	4.0	3.2
2018	28.5	29.8	4.0	6.5	5.6	5.6	5.0	4.0	4.8	2.4
2019	28.8	30.3	7.5	5.8	6.7	6.7	4.9	4.4	3.7	2.9
2020	31.8	23.9	8.1	7.8	4.4	4.4	3.4	4.0	3.4	2.7
2021	33.1	25.2	7.5	6.5	6.2	6.2	4.5	5.2	2.7	3.2
2022	24.2	28.3	8.9	6.0	6.1	6.1	5.1	4.2	5.7	4.7

[a] Leading cancer sites based on AFHSD oncology case classifications.
[b] Miscellaneous malignant cancers were defined as the following: malignant neoplasm of other and ill-defined sites (C76), secondary and unspecified malignant neoplasm of lymph nodes (C77), secondary malignant neoplasm of respiratory and digestive organs (C78), secondary malignant neoplasm of other and unspecified sites (C79), malignant neoplasm without specification of site (C80), Waldenström macroglobulinemia (C88), malignant neoplasms of independent (primary) multiple sites (C97), malignant neoplasm of spleen (C26.1), mesothelioma of other sites (C45.7), mesothelioma, unspecified (C45.9), myelodysplastic and myeloproliferative disease, not elsewhere classified (C94.6), multifocal and multisystemic (disseminated) Langerhans-cell histiocytosis [Letterer-Siwe disease] (C96.0), other and unspecified malignant neoplasms of lymphoid, hematopoietic and related tissue (C96.1), malignant mast cell neoplasm (C96.2), sarcoma of dendritic cells (accessory cells) (C96.4), multifocal and unisystemic Langerhans-cell histiocytosis (C96.5), unifocal Langerhans-cell histiocytosis (C96.6), other specified malignant neoplasms of lymphoid, haematopoietic and related tissue (C96.7), histiocytic sarcoma (C96.8), and malignant neoplasm of lymphoid, haematopoietic and related tissue, unspecified (C96.9).

The cancer risk for the active component military population may differ from the general U.S. population due to differences in behavioral exposures such as alcohol and tobacco use[1] as well as deployment or occupational-related exposures.[2-4] This Surveillance Snapshot presents the incidence of the 10 leading cancers among active component service members (ACSM) diagnosed from January 2018 through December 2022. Cancer cases were defined using Armed Forces Health Surveillance Division (AFHSD) case definitions, which are based on administrative diagnostic codes under the International Classification of Diseases, 10th revision (ICD-10).[5] For cancers without an existing AFHSD case definition, the following criteria classified a case: an inpatient encounter with a qualifying ICD-10 diagnostic code in the first diagnostic position (dx1); or an inpatient encounter with a qualifying diagnostic code in the second diagnostic position (dx2) and a treatment code (ICD-9: V580, V581*; ICD-10: Z510*, Z511*) in dx1; or 3 or more outpatient encounters within a 90-day period (but not on the same day) with a qualifying diagnostic code in dx1 or dx2. A cancer was counted once per person in a lifetime based on earliest diagnosis. Rates were calculated per 100,000 person-years, accounting for sex-specific rate calculations to female breast, testis, and prostate cancers.

Cases were classified for all ICD-10 Chapter 2 malignant neoplasms (C00-C96) to identify the leading cancer sites. Overall, there were 6,635 total incident cancer cases from 2018 to 2022; 77.5% (n=5,146) of these cases represented the leading 10 cancers among ACSM. Non-melanoma skin cancer (n=1,851) was the most frequent cancer, followed by testicular cancer (n=602), miscellaneous malignant cancer (n=484), thyroid cancer (n=440), and melanoma of the skin (n=391). The annual fluctuations in the incidence rate of diagnoses for each cancer are shown in the Figure. Overall, female breast cancer had the highest incidence over the 5-year surveillance period.

Disclaimer: The views expressed in this article are those of the authors and do not necessarily reflect the official policy of the Department of Defense nor the U.S. Government.

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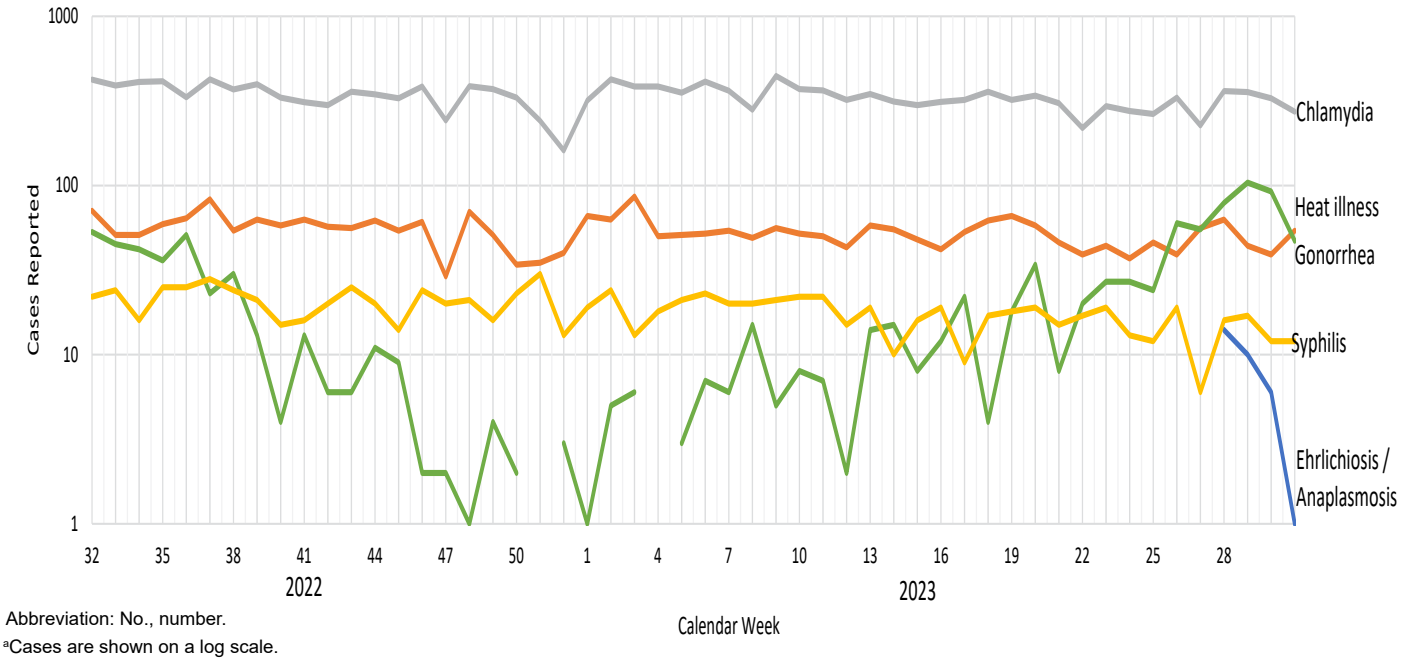
Reportable Medical Events, Military Health System Facilities, Week 31, Ending August 5, 2023

TOP 5 REPORTABLE MEDICAL EVENTS TRENDS FOR PREVIOUS YEAR BY CALENDAR WEEK, ACTIVE COMPONENT (AUGUST 6, 2022 - AUGUST 5, 2023)



Abbreviation: No., number.

[a]Cases are shown on a log scale.

Note: There were 0 heat illness cases in week 51 of 2022 and week 4 of 2023. 30 cases of Ehrlichiosis/Anaplasmosis were reported in July 2023, weeks 28-31; 1 case was reported in week 37 of 2022, otherwise 0 cases were reported in this timeframe.

Reportable Medical Events (RMEs) are documented in the Disease Reporting System internet (DRSi) by Military Health System providers and public health officials to monitor, control, and prevent the occurrence and spread of diseases of public health interest or readiness importance. These reports are reviewed by each service's public health surveillance hub. The DRSi collects reports for over 70 different RMEs, including infectious and non-infectious conditions, outbreak reports, STI risk surveys, and tuberculosis contact investigation reports. A complete list of RMEs is available in the *2022 Armed Forces Reportable Medical Events Guidelines and Case Definitions*.[1] Data reported in these tables are provisional and do not represent conclusive evidence until case reports are fully validated.

Total active component cases reported per week are displayed for the top 5 RMEs for the previous year. Each month, the graph is updated with the top 5 RMEs, and is presented with the current month's (July 2023) top 5 RMEs, which may differ from previous months. COVID-19 is excluded from these graphs due to changes in reporting and case definition updates in 2023.

In July 2023, 28 cases of ehrlichiosis and anaplasmosis were reported from a single Army reporting unit between weeks 28 and 31. Most cases (n=27) are classified as suspect, with 1 confirmed case. Dates of onset range from June 5 to July 13, 2023. Etiologic agents listed include *Ehrlichia ewingii* (n=14), *Ehrlichia chaffeensis* (n=6), Panola Mountain *Ehrlichia* (n=6), and undetermined or unlisted ehrlichiosis or anaplasmosis (n=2). All individuals had tick bites, which were documented, while attending Cadet Summer Training at Fort Knox, KY. The majority (n=26) of individuals did not present with any symptoms of infection but were advised to inquire about prophylactic treatment.

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TABLE. Reportable Medical Events, Military Health System Facilities, Week Ending August 5, 2023 (Week 31)[a]

Reportable Medical Event[b]	Active Component[c]					MHS Beneficiaries[d]
	June	July	YTD 2023	YTD 2022	Total, 2022	July
	no.	no.	no.	no.	no.	no.
Amebiasis	3	1	11	7	13	0
Arboviral Diseases, Neuroinvasive and Non-Neuroinvasive	0	0	0	1	1	0
Brucellosis	0	0	0	2	2	0
COVID-19-associated Hospitalization and Death[e]	7	6	73	0	7	34
Campylobacteriosis	31	27	158	150	229	28
Chikungunya Virus Disease	0	0	0	1	1	0
Chlamydia trachomatis	1,263	1,344	10,045	11,796	19,409	203
Cholera	1	2	4	1	2	0
Coccidioidomycosis	3	2	15	7	15	2
Cold Weather Injuries[f]	2	3	98	112	151	-
Cryptosporidiosis	8	8	48	25	46	1
Cyclosporiasis	4	7	12	5	10	7
Dengue Virus Infection	0	0	2	1	1	0
E. coli, Shiga Toxin-producing	11	10	40	46	67	4
Ehrlichiosis/Anaplasmosis	0	30	30	2	3	0
Giardiasis	8	4	44	44	71	0
Gonorrhea	185	209	1,574	2,062	3,302	31
Haemophilus influenzae, Invasive	0	1	1	1	1	1
Hantavirus Disease	1	0	1	0	1	0
Heat Illness[f]	142	348	701	779	1,213	-
Hepatitis A	0	1	5	9	16	0
Hepatitis B	8	5	89	72	119	6
Hepatitis C	5	3	32	31	57	4
Influenza-associated Hospitalization[g]	0	0	5	46	148	0
Lead Poisoning, Pediatric[h]	-	-	-	-	-	4
Legionellosis	1	0	3	2	4	0
Leishmaniasis	0	0	1	1	1	0
Leptospirosis	0	0	2	1	1	0
Lyme Disease	8	8	44	42	65	11
Malaria	0	4	13	14	26	0
Meningococcal Disease	0	0	2	1	2	0
Mpox	0	0	0	21	93	0
Norovirus	29	24	311	154	220	19
Pertussis	0	1	4	5	10	2
Post-Exposure Prophylaxis Against Rabies	41	66	345	303	512	42
Q Fever	0	1	2	2	3	0
Rubella	0	0	2	2	3	0
Salmonellosis	7	11	52	76	122	21
Schistosomiasis	0	0	0	1	1	0
Severe Acute Respiratory Syndrome (SARS)	0	0	0	1	1	0
Shigellosis	4	7	37	17	33	6
Spotted Fever Rickettsiosis	3	4	25	38	70	2
Syphilis (All)	76	53	513	583	1,044	10
Toxic Shock Syndrome	0	0	1	0	0	2
Trypanosomiasis	0	0	1	1	1	0
Tuberculosis	1	1	4	5	11	0
Tularemia	0	0	1	0	0	0
Typhoid Fever	1	0	1	0	0	0
Typhus Fever	1	0	2	1	1	1
Varicella	1	3	8	9	16	0
Total case counts	1,855	2,194	14,362	16,480	27,125	441

Abbreviations: RME, reportable medical event; MHS, Military Health System; YTD, year to date; no., number.

[a] RMEs reported through the DRSi as of August 31, 2023 are included in this report. RMEs were classified by date of diagnosis, or where unavailable, date of onset. Monthly comparisons are displayed for the period of June 1, 2023-June 30, 2023 and July 1, 2023-July 31, 2023. YTD comparison is displayed for the period of January 1, 2023-July 31, 2023 for MHS facilities. Previous year counts are provided as the following: previous year YTD–January 1, 2022-July 31, 2022; total 2022–January 1, 2022-December 31, 2022.

[b] RME categories with 0 reported cases among active component service members and MHS beneficiaries for the time periods covered were not included in this report.

[c] Services included in this report include Army, Navy, Air Force, Marine Corps, Coast Guard, and Space Force, including personnel classified as FMP 20 with Duty Status of AD, Recruit, or Cadet in DRSi.

[d] Beneficiaries included the following: individuals classified as FMP 20 with Duty Status of Retired and individuals with all other FMPs except 98 and 99. Civilians, contractors, and foreign nationals were excluded from these counts.

[e] Includes all cases of COVID-19 reported through DRSi prior to May 4, 2023.

[f] Only cases reported after case definition update on May 4, 2023. Includes only cases resulting in hospitalization or death

[g] Influenza-associated Hospitalization is reportable only for individuals aged 65 years or younger.

[h] Pediatric Lead Poisoning is reportable only for children aged 6 years or younger.

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