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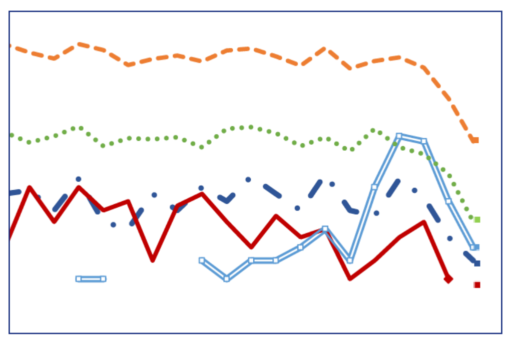

Distribution of Tobacco and Nicotine Use Indicators from the Periodic Health Assessment and Medical Diagnostic Codes Among U.S. Active Component Service Members, 2023

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Military service members remain a priority population for assessing the prevalence, patterns, and long-term consequences of tobacco and nicotine use. The limitations inherent to documenting use among military service members, however, complicate the design of exposure assessment. This study combined 2 data sources—by aggregating self-reported Periodic Health Assessment (PHA) survey data with International Classification of Diseases, 9th and 10th revisions, Clinical Modification (ICD-9-CM / ICD-10-CM) medical diagnostic codes—to classify nicotine and tobacco use as exposures delineated by recent use or history of any use. The study population included a total of 921,394 U.S. active component service members who completed a PHA in 2023. PHA classification for 'recent use' was defined by self-reported use of any tobacco or nicotine product within the past 30 days, whereas 'history of any use' included recent users in addition to those who reported cessation of use. The full roster of service members who completed the PHA in 2023 was matched to ambulatory and inpatient medical records within 30 days, before or after, the PHA sample period (December 1, 2022–January 31, 2024) to identify selected ICD-10-CM codes for recent use. Selected diagnostic codes for a 'history of any use' were queried for a period of 20 years preceding and 30 days following (January 1, 2004–January 31, 2024) the PHA sample period. Among PHA respondents, 22.0% (n=203,156) self-reported recent nicotine or tobacco use. When aggregating PHA data with recent exposure classified from diagnostic codes, the resulting assessment of recent nicotine or tobacco use increased to 28.7% (n=264,194). Critically, this aggregation identified 61,038 U.S. service members with no evidence of recent use on the PHA but with a concurrent clinical record during the specified matching period. Aggregating data sources for a history of any use only nominally improved the estimate, increasing it from 41.1% (PHA alone) to 43.1%. Agreement between sources was fair for both recent use (κ=0.28) and historical use (κ=0.36). The results of this study indicate that neither self-reported PHA data nor medical diagnostic codes alone provide a complete picture of tobacco and nicotine use among U.S. active component service members.

What are the new findings?

The combination of medical diagnostic codes with self-reported PHA survey responses increases exposure estimates of recent tobacco or nicotine use among U.S. active component service members to 28.7%, in comparison to 22.0% if exclusively assessing recent use from the PHA.

What is the impact on readiness and force health protection?

The integration of multiple data sources may provide a more comprehensive assessment of recent nicotine and tobacco exposure among service members, directly supporting enhanced public health surveillance.

A 2014 Surgeon General's report highlighted tobacco and nicotine use in the U.S. Armed Forces as a focus of careful study, underscoring a critical need for robust and continuous public health surveillance methods.[1] This need persists today, as the U.S. Surgeon General has identified U.S. military service members as a priority population for developing effective prevention and cessation programs.[2] The prevalence of tobacco use remains higher among active duty service members compared to the general U.S. population, compounding the issue of reduced military readiness.[3] The effects on short-term health and operational effectiveness are significant, impairing physical endurance, cognitive function and vision, while also slowing recovery from injury.[4] Furthermore, smoking degrades readiness by increasing the risk of work absenteeism, respiratory infections, and complications with wound healing.[4]

In the U.S. Department of War (DOW), several data sources are available to assess service members' tobacco and nicotine use, each characterized by different strengths and limitations. The Health Related Behaviors Survey (HRBS), a DOW flagship survey, in 2018 estimated 37.8% of service members currently used tobacco in some form, such as combustible cigarettes, e-cigarettes, cigars, smokeless tobacco, pipes, or hookahs. Limitations from the latest HRBS publication note that the response rate (9.6%) is considered low for survey research, which can result in a non-representative sample and affect the accuracy of prevalence estimates.[5] The DOW's annual Periodic Health Assessment (PHA) offers a more representative sample of service members, as a mandatory annual requirement to assess currency of individual medical readiness.[6] While survey data from the PHA provide specific, individual exposures by asking about a range of tobacco and nicotine use within the last 30 days, length of use, and past use, the mandated nature of the assessment may lead to under-reporting when compared to the confidential HRBS.[7]

Diagnostic codes from medical records, such as the International Classification of Diseases, 9th and 10th revisions, Clinical Modification (ICD-9-CM / ICD-10-CM) codes, provide an alternate measure. These include codes for current nicotine dependence, tobacco use, and a personal history of nicotine dependence. Use of these diagnostic codes have been shown to substantially under-estimate the prevalence of use, however, when compared to survey data.[8,9] This under-estimation may be influenced by service-branch-specific cultural norms and attitudes towards tobacco use, as well as a potential reluctance among service members to disclose behaviors to health care providers that could be perceived negatively or affect their careers.[10,11]

These inherent limitations associated with the documentation of tobacco and nicotine use complicate the design of epidemiological studies, including those measuring prevalence and incidence, monitoring trends, and assessing risk factors for various health outcomes. Furthermore, the longitudinal characterization of use presents methodological challenges, as individuals may initiate, quit, and relapse multiple times throughout their military careers. The primary objective of this study was to evaluate the concordance between 2 distinct data sources—self-reported surveys from the Periodic Health Assessment (PHA) and administrative medical diagnostic codes—to classify all-inclusive categories for tobacco and nicotine use. This study specifically measured and compared the level of agreement of classifications for "recent nicotine or tobacco use" and "history of any nicotine or tobacco use," to understand the unique contribution of each data source. By characterizing the distribution of data for this complex behavior, these results are intended to inform the development of standardized classifications by highlighting the strengths and limitations of relying upon any single data source alone.

Methods

This analysis included active component service members (ACSMs) of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard; Space Force ACSMs were included with the Air Force. A roster of service members who completed a PHA during 2023, regardless of any tobacco or nicotine use responses, was compiled. Per DOW Instruction 6200.06, service members are required to complete a PHA every 12 months. The PHA provides an annual, standardized health assessment for U.S. military service members to assess individual medical readiness, including occupational and environmental health evaluations, with provision of evidence-based preventive health information and recommendations.[6]

The full roster of service members who completed PHA during 2023, regardless of any tobacco or nicotine use responses, was matched by unique identifiers to query ambulatory and inpatient medical records for each ACSM maintained in the Defense Medical Surveillance System (DMSS). DMSS contains all encounters in military medical and civilian treatment facilities when reimbursed through the Military Health System. From the PHA responses and applicable medical records, evidence of exposure to tobacco or nicotine was classified into 2 separate outcomes: 1) recent use or 2) history of any use.

Recent use

As shown in **Table 1**, a service member was classified as a 'recent user' from the PHA if that service member reported use of any listed tobacco or nicotine product (e.g., cigarette, e-cigarette, chewing tobacco) on at least 1 occasion within the past 30 days. To identify recent tobacco or nicotine use from medical diagnostic codes, we examined medical records for relevant diagnostic codes documented within 30 days, before or after, the PHA sample period (December 1, 2022–January 31, 2024). This method established a standardized documentation period corresponding to the 30-day use period assessed in the survey. Inpatient and ambulatory care records with ICD-10-CM diagnostic codes for nicotine dependence (F17.2*), tobacco use (Z72.0), and tobacco use disorder complicating pregnancy, childbirth and puerperium (O99.33*) were queried from any diagnostic position to document recent nicotine or tobacco use. For the purposes of this study, nicotine dependence and tobacco use disorders were broadly classified as recent tobacco and nicotine use. Service members with resulting medical records matched for these diagnostic codes were classified as positive for diagnostic classification of recent nicotine or tobacco use; conversely, if no applicable medical record was matched, the diagnostic classification was coded as negative.

History of any use

The classification parameters for documenting a history of any tobacco or nicotine use are shown in **Table 1**; this broader method aims to identify both recent and former users. The PHA classification includes everyone identified by the 'recent use' method, but it expands to capture individuals who select the response "I used tobacco in the past, but quit." To define a history of any nicotine or tobacco use from medical diagnostic codes, applicable medical records were queried for the preceding 20 years through 30 days following the PHA completion period (January 1, 2004–January 31, 2024). Inpatient and ambulatory care records with ICD-9-CM/ ICD-10-CM diagnostic codes for nicotine

TABLE 1. Classifications for Tobacco and Nicotine Recent Use, History of Any Use from the Periodic Health Assessment and Medical Diagnostic Codes

Periodic Health Assessment		
Definition	PHA Survey Item	Response
Recent use	In the past 30 days, which of the following products have you used on at least 1 day?	Used once in the last 30 days: cigarettes
		Used once in last 30 days: cigars
		Used once in last 30 days: chewing tobacco
		Used once in last 30 days: electronic cigarettes
		Used once in last 30 days: hookahs
		Used once in last 30 days: pipes
		Used once in last 30 days: snus
		Used once in last 30 days: dissolvable tobacco
		Used once in last 30 days: bidis
		Used once in last 30 days: other tobacco product
For history of any use, include recent use survey items, plus:	Which of the following describes your past tobacco use?	I used tobacco in the past, but quit.
ICD-9-CM and ICD-10-CM Diagnostic Codes[a]		
Definition	Codes	Description
Recent use	ICD-10-CM: F17.2*; ICD-9-CM: 305.1	Nicotine dependence; tobacco use disorder
	ICD-10-CM: Z72.0	Tobacco use
	ICD-10-CM: O99.33*; ICD-9-CM: 649.0*	Tobacco use disorder complicating pregnancy, childbirth, and the puerperium
For history of any use, include recent use codes, plus:	ICD-10-CM: Z87.891; ICD-9-CM: V15.82	Personal history of nicotine dependence[b]

Abbreviations: ICD-9-CM, International Classification of Diseases, 9th Revision; ICD-10-CM, International Classification of Diseases, 10th Revision.

[a] ICD-10-CM code for 'tobacco use' was introduced in 2015; there is no comparable ICD-9-CM code. Prior to 2015, the only code referencing 'tobacco use' was ICD-9-CM 305.1 ('tobacco use disorder'), which was used to indicate diagnosis of tobacco dependence. For the purposes of this study, nicotine dependence, tobacco use disorders, or history of nicotine dependence are broadly classified as past history tobacco and nicotine use.

[b] This code denotes personal history of nicotine dependence, signifying that the individual previously experienced nicotine dependence but was not currently experiencing it.

dependence (305.1 / F17.2*), tobacco use (Z72.0), tobacco use disorder complicating pregnancy, childbirth and puerperium (649.0* / O99.33*), and personal history of nicotine dependence (Z87.891 / V15.82) were queried from any diagnostic position. An ICD-10-CM code for 'tobacco use' was introduced in 2015; there is no comparable ICD-9-CM code. Prior to 2015, the only ICD code referencing 'tobacco use' was ICD-9-CM 305.1 ('tobacco use disorder'), which was used to indicate a diagnosis of tobacco dependence. For the purposes of this study, nicotine dependence, tobacco use disorders, or a history of nicotine dependence were broadly classified as past history of tobacco and nicotine use. Service members with resulting medical records matched for these diagnostic codes were classified as positive for diagnostic classification of any nicotine or tobacco use; conversely, if no applicable medical record was matched, diagnostic classification was coded as negative.

Analysis

The dichotomous outcomes for tobacco and nicotine 'recent use' and 'history of any use' were stratified to assess overlap in classification exposure by data source. Cohen's kappa was calculated to examine level of agreement between self-reported PHA responses and diagnostic code documentation. To examine demographic differences of recent or history of tobacco or nicotine use by data source classification, we investigated the differences between branch of service, sex, categorized age at date of completion, and racial and ethnic group by separating responses into 1 of the 3 data source categories: concurrent PHA and diagnostic code documentation, exclusive PHA documentation, and exclusive diagnostic code documentation.

Results

Recent use

A total of 921,394 U.S. ACSMs completed a PHA documented in 2023 **(Table 2)**. Among those service members, 22.0% (n=203,156) self-reported recent nicotine or tobacco use on the PHA. The most frequent responses for tobacco or nicotine use within the last 30 days were reported for electronic cigarettes (n=115,486), cigarettes (n=47,325), chewing tobacco (n=45,777), cigars (n=21,517), and other tobacco products (n=9,630).

TABLE 2. Exposure Classification Agreement for Tobacco or Nicotine Use by the Periodic Health Assessment and Medical Diagnostic Codes[a]

		PHA (+)	PHA (−)	Row Totals	
Recent Nicotine or Tobacco Use					
		No.	No.	No.	%
Diagnostic code (+)	*n*	65,739	61,038	126,777	13.8
Diagnostic code (−)	*n*	137,417	657,200	794,617	86.2
Column totals	*n*	203,156	718,238	921,394	100
	%	22.0	78.0	κ: 0.2758 (0.2734, 0.2781)	
History of Any Nicotine or Tobacco Use					
		PHA (+)	PHA (-)	Row Totals	
		No.	No.	No.	%
Diagnostic code (+)	*n*	137,365	18,787	156,152	16.9
Diagnostic code (−)	*n*	241,298	523,944	765,242	83.1
Column totals	*n*	378,663	542,731	921,394	100
	%	41.1	58.9	κ: 0.3601 (0.3584, 0.3619)	

Abbreviations: +, positive response; - , negative response; No., number; *n*, number; PHA, Periodic Health Assessment; κ, Cohen's kappa.
[a]Based on sample of active component service members who completed a PHA in 2023.

Among the 921,394 ACSMs who completed a PHA in 2023, 126,777 (13.8%) had a medical record with a diagnostic code for nicotine dependence (n=66,528) or tobacco use (n=88,519) during the period December 1, 2022–January 31, 2024; few service members had a diagnostic code for tobacco use disorder complicating pregnancy (n=1,212) (data not shown). Aggregation of PHA data with exposure determination captured exclusively from diagnostic codes (n=61,038) increased the estimate of recent nicotine or tobacco use to 28.7% (n=264,194). If exposure assessment was limited to medical records, independent of PHA responses, the estimated recent use of tobacco or nicotine exposure for this sample reduced to 13.8% (n=126,777). The Cohen's kappa statistic of 0.28 indicates a fair level of agreement between the PHA and diagnostic codes for identifying recent tobacco or nicotine use **(Table 2)**.

The demographic distribution of the 264,194 recent tobacco or nicotine users was examined for ACSMs with exclusive PHA exposure (n=137,417, 52.0%), diagnostic coding exclusivity (n=61,038, 23.1%), and concurrent data sources (n=65,739, 24.9%) **(Table 2)**. Compared to other services, the Marine Corps was over-represented in exclusive PHA data documentation versus exclusive diagnostic data (66.1% vs 15.2%). Documentation of tobacco or nicotine use exclusively from the PHA decreased with age, with a substantial difference observed for ACSMs younger than age 25 years (82.0% from PHA vs. 6.7% from diagnostic codes) **(Table 3)**.

History of any use

Of the 921,394 ACSMs who completed a PHA in 2023, 41.1% (n=378,663) self-reported a history of any nicotine or tobacco use **(Table 2)**. A total of 176,004 ACSMs reported using tobacco in the past but had currently quit, whereas all other ACSMs were classified as 'any use' from the 'recent use' PHA classification criterion.

After matching the PHA respondent roster to medical records for the period January 1, 2004–January 31, 2024, a total of 156,152 ACSMs had an applicable medical record with evidence of any history of tobacco or nicotine use. A total of 52,370 ACSMs had a record for a personal history of nicotine dependence, which did not exceed the total number of medical records identified with diagnoses for tobacco use (n=93,919) or nicotine dependence (n=71,219) (data not shown). Aggregating PHA data with exposure determination captured exclusively from diagnostic codes (n=18,787) only increased the history of any use estimate to 43.1% (n=397,450). If a historical exposure assessment for tobacco or nicotine use was limited to medical records, independent of PHA responses, the estimated 'any use' of tobacco or nicotine exposure for this sample drops to 16.9% (n=156,152) The Cohen's kappa statistic of 0.36 indicates a fair level of agreement between the PHA and diagnostic codes for identifying a history of any tobacco or nicotine use **(Table 2)**.

The demographic distribution of the 397,450 ACSMs with a history of tobacco or nicotine use was examined for those with exclusive PHA exposure (n=241,298, 60.7%), diagnostic coding exclusivity (n=18,787, 4.7%), and concurrent data sources (n=137,365, 34.6%) **(Table 4)**. The Marine Corps represented the highest service-specific proportion of exclusive PHA documentation for tobacco or nicotine use (71.8%) and, consequentially, lowest concurrent PHA and diagnostic code documentation (24.8%). Exclusive PHA documentation decreased with age, while concurrent PHA and diagnostic code documentation increased with age.

Discussion

The results of this study indicate that neither self-reported PHA data nor medical diagnostic codes alone provide a complete picture for all-inclusive classifications of tobacco and nicotine use among ACSMs. To identify recent use, reliance on either PHA data or diagnostic codes in isolation leads to significant under-estimation. Aggregating the 2 sources increased the captured population from 22.0% (PHA alone) to 28.7%. Analysis revealed that over 61,000 recent users would be missed without the inclusion of diagnostic codes.

TABLE 3. Estimates of Recent Tobacco or Nicotine Use, Classified by Self-Reporting from the Periodic Health Assessment or Medical Diagnostic Codes[a]

	Concurrent PHA and Diagnostic Code Documentation		Exclusive Self-Reporting from PHA		Exclusive Documentation from Diagnostic Codes		All
	No.	%	No.	%	No.	%	No.
Total	65,739	24.9	137,417	52.0	61,038	23.1	264,194
Branch of service							
Army	31,468	27.3	57,059	49.6	26,574	23.1	115,101
Navy	12,119	25.8	24,200	51.6	10,576	22.6	46,895
Air Force[b]	14,215	23.3	30,099	49.2	16,805	27.5	61,119
Marine Corps	6,489	18.7	22,984	66.1	5,287	15.2	34,760
Coast Guard	1,447	22.9	3,073	48.7	1,792	28.4	6,312
Unknown[c]	1	14.3	2	28.6	4	57.1	7
Sex							
Male	59,283	25.3	123,017	52.4	52,282	22.3	234,582
Female	6,456	21.8	14,400	48.6	8,756	29.6	29,612
Age, *y*							
Unknown	0	0.0	1	100	0	0.0	1
<25	8,605	11.4	61,944	82.0	5,027	6.7	75,576
25–29	14,445	21.8	41,373	62.5	10,342	15.6	66,160
30–34	15,660	31.6	18,735	37.8	15,118	30.5	49,513
35–39	15,851	37.0	9,755	22.8	17,179	40.2	42,785
40+	11,178	37.1	5,609	18.6	13,372	44.3	30,159
Race and ethnicity							
White, non-Hispanic	41,253	26.5	77,437	49.8	36,927	23.7	155,617
Black, non-Hispanic	8,209	23.3	19,505	55.3	7,528	21.4	35,242
Hispanic	8,050	19.3	24,413	58.4	9,351	22.4	41,814
Other	8,227	26.1	16,062	51.0	7,232	22.9	31,521
Military rank							
Enlisted	59,377	25.2	125,660	53.4	50,182	21.3	235,219
Officer	6,360	22.0	11,719	40.5	10,851	37.5	28,930
Unknown	2	4.4	38	84.4	5	11.1	45

Abbreviations: PHA, Periodic Health Assessment; No., number; *y*, years.
[a] Based on sample of active component service members who completed a PHA in 2023.
[b] Includes Space Force members.
[c] Service members documented as active duty but branch of service unknown.

Conversely, the addition of 2 decades of medical records only marginally increased an estimate for history of any use from 41.1% (PHA alone) to 43.1%.

These findings contextualize existing data sources for all-inclusive classifications of tobacco and nicotine use, ranging from self-reported behaviors, clinically documented use, and diagnosed disorders. By comparing self-reported data from the PHA against administrative medical diagnostic codes, this study sought to understand the unique contribution of each source. The Armed Forces Health Surveillance Division (AFHSD) currently maintains standardized classifications for covariates that may typically be included in investigations, such as clinical overweight/obesity and non-medical factors influencing health (e.g., social, environmental and behavioral factors)[12,13]; however, tobacco and nicotine use, in addition to other substance abuse disorders such as alcohol dependence, are not currently represented in a standardized surveillance case definition form. The results from this study are intended to inform the development of standardized classifications by highlighting the strengths and limitations of relying on any single data source alone.

The fair level of agreement measured from the Cohen's kappa statistic indicates there may be substantial non-random differences in the data captured by diagnostic codes and PHA forms. The observed level of agreement for both the 'recent use' (78.5%) and 'history of any use' (71.8%) classifications demonstrate some consistency between the 2 sources, although not reliably enough to substitute one for the other. They capture different populations, with the PHA more effective for younger service members and the Marine Corps, while diagnostic codes play an increasing role with advancing age. Therefore, a combined surveillance strategy may be critical for accurately monitoring current behaviors and informing targeted interventions.

TABLE 4. Estimates of Any History of Tobacco or Nicotine Use, Classified by Self-Reporting from the Periodic Health Assessment or Diagnostic Codes[a]

	Concurrent PHA and Diagnostic Code Documentation		Exclusive Self-Reporting from PHA		Exclusive Documentation from Diagnostic Codes		All
	No.	%	No.	%	No.	%	No.
Total	137,365	34.6	241,298	60.7	18,787	4.7	397,450
Branch of service							
Army	60,154	36.8	94,980	58.0	8,527	5.2	163,661
Navy	25,377	34.8	44,366	60.9	3,082	4.2	72,825
Air Force[b]	35,367	35.4	59,445	59.5	5,020	5.0	99,832
Marine Corps	12,429	24.8	35,995	71.8	1,705	3.4	50,129
Coast Guard	4,033	36.7	6,510	59.2	452	4.1	10,995
Unknown[c]	5	62.5	2	25.0	1	12.5	8
Sex							
Male	120,492	34.4	215,231	61.4	14,910	4.3	350,633
Female	16,873	36.0	26,067	55.7	3,877	8.3	46,817
Age, *y*							
Unknown	13,654	12.9	89,179	84.2	3,097	2.9	105,930
<25	26,477	25.7	72,772	70.6	3,857	3.7	103,106
25–29	32,503	42.7	39,402	51.7	4,252	5.6	76,157
30–34	36,199	57.2	22,865	36.2	4,185	6.6	63,249
35–39	28,531	58.2	17,080	34.9	3,396	6.9	49,007
40+	1	100	—	0.0	—	0.0	1
Race and ethnicity							
White, non-Hispanic	86,176	37.0	137,490	59.0	9,466	4.1	233,132
Black, non-Hispanic	15,658	31.6	30,333	61.2	3,602	7.3	49,593
Hispanic	18,531	27.7	44,696	66.9	3,574	5.4	66,801
Other	17,000	35.5	28,779	60.1	2,145	4.5	47,924
Military rank							
Enlisted	118,855	34.8	208,060	60.9	14,964	4.4	341,879
Officer	18,502	33.3	33,161	59.8	3,823	6.9	55,486
Unknown	8	9.4	77	90.6	—	0.0	85

Abbreviations: PHA. Periodic Health Assessment; No., number; *y*, years.

[a] Based on sample of active component service members who completed a PHA in 2023.

[b] Includes Space Force members.

[c] Service members documented as active duty but branch of service unknown.

The assignment of a diagnostic code for tobacco use is often illness-driven, meaning it is more likely to be recorded when a service member seeks care for a related health issue. Consequently, diagnostic codes may over-represent individuals already experiencing tobacco-related health problems, while the PHA provides a broader, more routine representation of use. This may explain why PHA-exclusive data skew heavily toward younger service members, particularly those under age 25 years, who may not yet have developed chronic conditions that would trigger a diagnostic code during a health care visit.

The Marine Corps also represented a higher service-specific proportion of PHA-exclusive data for both recent and historical use. This finding may be due to different health care-seeking behaviors in age groups and branches of service. As the PHA is completed with health care provider supervision,[6] self-reporting could be biased to avoid perceived negative repercussions of reporting, or could be skewed by service-specific traditions related to tobacco use or health care seeking.[10,11]

This study aggregated multiple diagnostic codes into a single category for tobacco and nicotine use. It is important, however, to recognize the distinctions between these codes, as their combination can make the results of comparative analyses difficult to interpret. Clinical practice uses specific ICD-10 codes to differentiate between active tobacco use (Z72.0), nicotine dependence (F17.2*), and personal history of nicotine dependence (Z87.891). While a health care provider can assign a tobacco use diagnosis with individual discretion, a diagnosis of tobacco dependence requires specific clinical and diagnostic criteria. This clinical nuance is not captured in the PHA's more generalized, self-reported, checked-box format, which focuses on current use patterns rather than formal diagnoses of dependence or historical use.

This assessment is subject to additional limitations. A PHA is recorded as overdue if not completed by 90 days after the due date; thus, ACSMs who were overdue for an annual PHA may not be represented. Additionally, the evaluation of tobacco and nicotine use from medical records may be affected by incomplete data due to coding practices. Although medical codes are specifically allocated to indicate smoking status, an important challenge is whether providers properly document this behavioral risk factor in administrative claims data, which are generated for billing purposes.[14] Additionally, incomplete data may pose a limitation for occurrences of missing medical records. The issue of missing medical records for this cohort is not a significant concern, however. Of the 921,394 ACSMs who completed a PHA in 2023, only 328 had no medical records over the preceding 20-year period.

This analysis did not query open text fields for non-structured data documented on the PHA or within medical record chart notes. One analysis found that 35% of individuals with no structured ICD code for 'former smoker' had this information in some form in open text notes on their chart.[9] Free-text analysis of the standardized PHA survey can provide valuable insights into emerging tobacco and nicotine products not captured by checked-box responses. For instance, nicotine pouches—dissolvable microfiber pouches of nicotine salt powder—have recently gained popularity in the U.S.[15] A convenience-based, self-reported survey indicated that nicotine pouch use among U.S. military personnel is 10 times higher than in the general adult population.[16] Although the current study did not specifically measure nicotine pouch use, a total of 9,630 ACSMs completing a PHA in 2023 reported using an "other" tobacco product. Analyzing the free-text responses associated with this 'other' category may reveal more information about emerging product use.

These data are meant to inform future case-finding development processes for tobacco and nicotine use. Additional modifications to the surveillance definitions or matching processes may be required, either to improve estimation accuracy or simplification for routine processing. The 30-day overlap period provided a crude method to match PHA responses with medical records, to account for any variance in 30-day reporting and potential delays in diagnostic documentation. Thus, additional consideration may be required to improve precision of timing between PHA responses and medical diagnostic codes.

The results of this study indicate that neither self-reported PHA data nor medical diagnostic codes alone provide a complete picture of tobacco and nicotine use among ACSMs. The fair level of agreement between sources, particularly for recent use, highlights that each method captures a demographically distinct subset of users, underscoring the need for a multi-faceted approach to public health surveillance. This combined methodological approach may enhance future public health surveillance, improve the accuracy of epidemiological studies, and ultimately provide a stronger evidence base for policies aimed at improving the health and readiness of the force.

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Head and Neck Cancer Among U.S. Active Component Service Members, 2010–2024

Christa E. Goodwin, DMD, MS

This study utilized de-identified surveillance data to estimate the incidence of head and neck cancer among active component service members (Army, Navy, Air Force, Marine Corps, Coast Guard) from 2010 through 2024. This report updates the June 2021 *MSMR* analysis of oral and pharyngeal cancers (2007-2019) by expanding the case definition to include all head and neck cancers and extending the surveillance period through 2024. There were 549 cases of head and neck cancer diagnosed in the active component military during the 15-year period of analysis. The Army had the highest 15-year incidence rate (3.3 per 100,000 person-years) compared to the Navy (2.6 per 100,000), Air Force (2.6 per 100,000), Coast Guard (2.0 per 100,000), and Marine Corps (1.3 per 100,000). Service members ages 40 years and older had the highest overall incidence rate (12.3 per 100,000), which was 3.3 times the next highest rate observed among those ages 35-39 years. The 15-year male incidence rate (2.9 per 100,000) was greater than that among females (1.7 per 100,000). The parotid gland was the most common site of diagnosis, comprising 14.8% of cases.

What are the new findings?

From 2010 through 2024, 549 cases of head and neck cancer were diagnosed among U.S. active component service members. The branch of service, sex, and age group with the highest incidence rates were the Army, males, and those ages 40 years and older. The most common site was the parotid gland.

What is the impact on readiness and force health protection?

This report provides the most current head and neck cancer incidence data for active component service members from 2010 through 2024; it establishes baseline rates for monitoring of future trends and highlights specific high-risk populations (e.g., men, Army personnel, service members ages 40 years and older). Although head and neck cancer is the seventh most prevalent cancer worldwide, its incidence among active component service members is seldom reported. Head and neck cancer is often not diagnosed until it has metastasized. Significant physical limitations (e.g., difficulty chewing, speaking, and swallowing) and psychosocial effects (e.g., anxiety, depression, social isolation), compromising service member readiness, can accompany this type of cancer.

Head and neck cancer (HNC), the seventh most prevalent cancer worldwide,[1,2] is a collective term for cancers originating in the head and neck region including the lip, oral cavity, nasal cavity, paranasal sinuses, salivary glands, pharynx, and larynx. In 2022, there were over 940,000 new cases of HNC and 480,000 fatalities globally. [1,2] Signs and symptoms may vary depending upon where specifically within the head and neck region the cancer originated. Cancer originating in the oral cavity may result in sores that do not heal, growth or swelling causing dentures to fit poorly, and unusual bleeding or pain.[3,4] Alternatively, cancer that originates in the pharynx may cause difficulty with essential functions including breathing, speaking, and swallowing food.[3,4] Various factors dictate the course of treatment including the location and stage of the tumor, as well as patient-specific factors, such as age and health history. Considering the complexity of this type of cancer and the numerous subsites, a multidisciplinary approach to treatment is required.[5]

Survival rates, like course of treatment, are strongly influenced by the location and stage at diagnosis. According to the National Cancer Institute's Surveillance, Epidemiology, and End Results Program, the overall 5-year relative survival rate of oral cavity and pharynx cancer is 69.5%.[6] When considering the stage at diagnosis, the 5-year survival rates for localized (i.e., confined to primary site), regional (i.e., spread to regional lymph nodes), and distant (i.e., metastasized) oral cavity and pharynx cancer are 88.4%, 69.4%, and 36.9%, respectively.[6] Laryngeal cancer survival rates, however, are lower compared to oral cavity and pharynx cancer.[7] The overall 5-year relative survival rate is 62.1%, and the 5-year survival rates for localized, regional, and distant laryngeal cancer are 79.3%, 49%, and 35.2%, respectively.[7]

Major risk factors of HNC include alcohol and tobacco use, betel nut chewing, and infection with human papillomavirus (HPV).[8] HPV infections are usually asymptomatic and resolve naturally. However, long-lasting infections with high-risk strains of HPV (16 and 18) can cause various types of cancer (e.g., anal, cervical, oropharyngeal, penile, vaginal, vulvar).[9,10] Remarkably, about 70% of oropharyngeal squamous cell carcinoma cases in the U.S. are attributed to HPV.[8,10,11]

Additional risk factors of HNC include genetics, Epstein-Barr virus infection, radiation therapy, exposure to occupational or environmental carcinogens, and immunodeficiency.[8] HNC is more likely to be diagnosed in those older than age 55 years and is more than twice as common in men compared to women.[3,12,13] Moreover, a recent study determined that men are far more susceptible to HNC compared to women, regardless of tobacco and alcohol use.[13]

Numerous studies have explored the incidence of HNC among military veterans; the same cannot be said about active component service members (ACSMs). This is unsurprising, as the active component military population is considered a generally young population, and HNC is significantly more common among those older than age 55 years. A recent study investigated the incidence of the 16 most common cancers among ACSMs[14]; HNC was not included in that list. This type of cancer represents a small component of the overall cancer burden among this population and, consequently, may not often be explored. However, HNC is usually not diagnosed until it has metastasized. HNC can be accompanied by significant physical limitations (e.g., difficulty chewing, speaking, and swallowing) and psychosocial effects (e.g., anxiety, depression, social isolation), compromising service member readiness. Investigating its incidence among ACSMs is important and relevant. This report serves as an update to the June 2021 *MSMR* analysis on the incidence of oral cavity and pharynx cancers among ACSMs from 2007 through 2019, expanding the case definition to include all HNCs and extending the surveillance period to 2010-2024.[15]

Methods

This investigation was completed at the Tri-Service Center for Oral Health Studies (TSCOHS), a center of the Uniformed Services University (USU), the nation's federal health professions academy. The USU Human Research Protection Program approved this study, as protocol DBS.2025.827. Data were obtained from the Armed Forces Health Surveillance Division (AFHSD), the central epidemiological health resource for the U.S. military.

The surveillance population included ACSMs of the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard diagnosed with HNC from the January 1, 2010 through December 31, 2024. Cases were identified by International Classification of Diseases, 9th and 10th revisions (ICD-9/ICD-10), codes for malignant neoplasms of the lip, oral cavity, pharynx, nasal cavity, larynx, and sinuses **(Table 1)**. This report builds upon a prior 2021 analysis[15] of the same population (with the addition of the Coast Guard) from 2007 to 2019 but uses a broader case definition. The prior study was restricted to malignant neoplasms of the lip, oral cavity, and pharynx.

For surveillance purposes, a case of HNC was defined by AFHSD as either 1 hospitalization with a case defining diagnosis of HNC **(Table 1)** in the first diagnostic position; or 1 hospitalization with a procedure code indicating radiotherapy, chemotherapy, or immunotherapy treatment in the first diagnostic position and a case defining diagnosis of HNC **(Table 1)** in the second diagnostic position; or 3 or more outpatient medical encounters within a 90-day period, with a case-defining HNC diagnosis **(Table 1)** in the first or second diagnostic position. For those who met the case definition, the incidence date was the date of the first qualifying hospitalization or outpatient medical encounter with a case-defining HNC diagnosis. An individual was considered an incident case once per lifetime. Additional variables evaluated included branch of service, sex, year of diagnosis, and age at diagnosis. Annual incidence rates (IRs) were calculated for each service branch, sex, and age group, by dividing the number of cases in that subgroup by the number of ACSMs reported in the Defense Medical Epidemiology Database (DMED) for that subgroup and year. The ACSM population counts reported by DMED are the cumulative person years (p-yrs) contributed during the calendar year of interest for the population substratum.

TABLE 1. ICD-9 and ICD-10 Diagnostic Codes Used to Identify Head and Neck Cancer Cases, U.S. Active Component Service Members, 2010–2024

ICD-9	ICD-10	Site
140.0–149.9	C00.0–C14.8	Malignant neoplasm of lip, oral cavity, and pharynx
160	C30.0	Malignant neoplasm of the nasal cavity
160.2–160.5	C31.0–C31.3	Malignant neoplasm of the maxillary sinus, ethmoidal sinus, frontal sinus, and sphenoid sinus
161.0–161.9	C32.0–C32.9	Malignant neoplasm of larynx

Abbreviations: ICD-9, International Classification of Diseases, 9th Revision; ICD-10, International Classification of Diseases, 10th Revision.

Results

From 2010 through 2024, 549 cases of HNC were diagnosed among U.S. ACSMs. Yearly IRs ranged from 1.9 to 3.6 cases per 100,000 p-yrs **(Figure 1)** with an overall IR of 2.7 cases per 100,000 p-yrs. The number of HNC cases among male service members (n=492) was far greater than that among female service members (n=57) **(Table 2)**. Likewise, the overall IR among men (2.9 per 100,000 p-yrs) exceeded that of women (1.7 per 100,000 p-yrs). As of 2024, male service members accounted for 82.2% of the active component and an even greater proportion (89.6%) of all identified HNC cases during the study period **(Table 2)**.

The largest number (31) of cases occurred among service members who were age 43 years at diagnosis. When evaluated by age group, service members ages 40 years and older accounted for the largest proportion (47.5%) of HNC cases, with the largest overall IR (12.3 per 100,000 p-yrs) compared to the remaining younger age groups **(Table 2)**. As of 2024, service members ages 40 years and older comprised only 10.5% of the active component; the majority (60%) of the active component is younger than age 30 years.

The Army had the largest number of HNC cases (n=247), followed by the Navy (n=128), Air Force (n=127), Marine Corps (n=35), and finally Coast Guard (n=12) **(Table 2)**. The Army accounts for the greatest proportion (34.1% in 2024) of the active component and had an even greater proportion of all cases (45%). Likewise, the Coast Guard constitutes the smallest proportion (3.1% in 2024) of the active component and had the smallest proportion (2.2%) of all cases. The Coast Guard did not have the lowest overall IR, however, which was evidenced by the Marine Corps, with an IR of 1.3 cases per 100,000 p-yrs; the Army had the highest overall IR (3.3 per 100,000 p-yrs) **(Table 2)**.

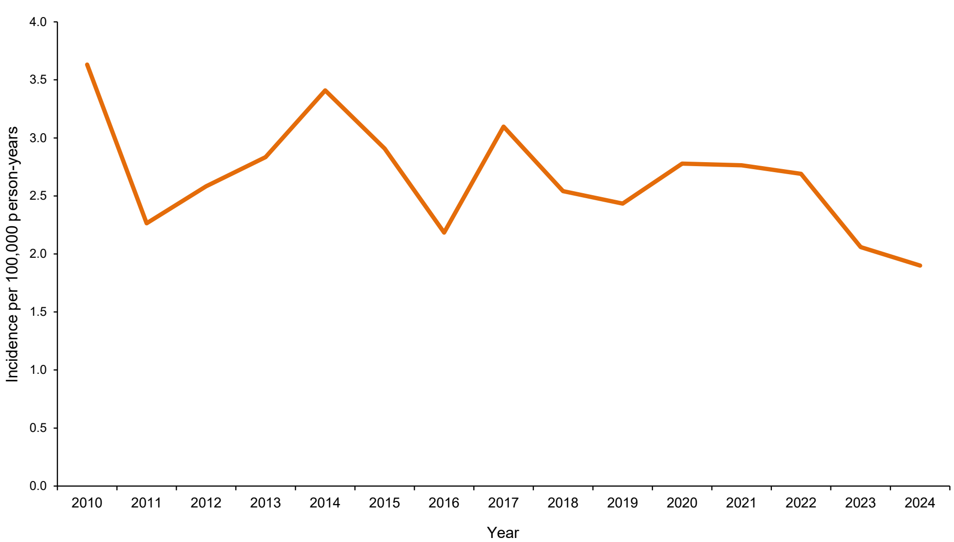
The 10 most frequent sites diagnosed with HNC are presented in **Figure 2**. 'Unspecified' indicates that the subsite was not documented. For instance, 'tongue, unspecified' signifies that the specific location of the tumor on the tongue (e.g., border, dorsal, base) is unknown. The greatest number of cases occurred in the parotid gland (n=81), accounting for 14.8% of all cases during the 15-year surveillance period. However, if combining cases diagnosed in the same primary location, the greatest number of cases (n=94, or 17.1%) occurred on the tongue (tongue, unspecified=57; tongue base=37).

TABLE 2. Counts, Rates, Percentages of All Head and Neck Cancer Cases, U.S. Active Component Service Members, 2010–2024, and Categorical Percentages of the Active Component, 2024

	No.	Rate[a]	% of Total Cases 2010–2024	% of AC 2024
Total	549	2.7	100	—
Sex				
Male	492	2.9	89.6	82.2
Female	57	1.7	10.4	17.8
Age group, *y*				
<20	3	0.2	0.5	6.6
20–24	61	0.9	11.1	30.0
25–29	74	1.5	13.5	23.4
30–34	61	1.8	11.1	16.7
35–39	89	3.7	16.2	12.9
40+	261	12.3	47.5	10.5
Branch of service				
Army	247	3.3	45.0	34.1
Navy	128	2.6	23.3	25.2
Air Force	127	2.6	23.1	24.8
Marine Corps	35	1.3	6.4	12.9
Coast Guard	12	2.0	2.2	3.1

Abbreviations: No., number; AC, active component; *y*, years.
[a]Incidence rate per 100,000 person-years.

FIGURE 1. Incidence Rates of Head and Neck Cancer, U.S. Active Component Service Members, 2010–2024



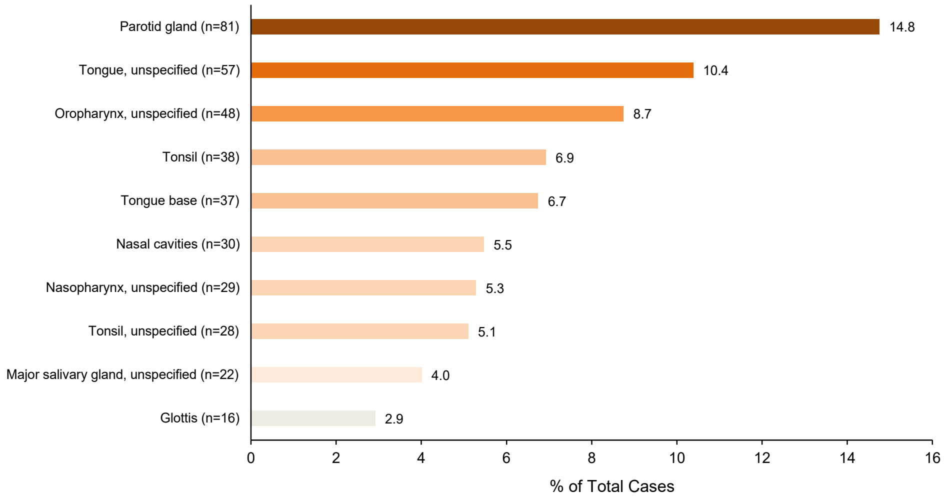
Discussion

This study utilized de-identified surveillance data from AFHSD to estimate the incidence of HNC among ACSMs (Army, Navy, Air Force, Marine Corps, Coast Guard) from 2010 through 2024. This is the first time this group of cancers has been investigated by TSCOHS. These data can help guide military public health policy and future research into specific occupational or lifestyle risk factors within high-risk demographic groups.

In the general population, risk of diagnosis of HNC significantly increases with age; the same can be said for the military. Service members ages 40 years and older comprise the smallest proportion of the active component, yet had the greatest proportion of cases and an IR 3.3 times the next highest IR, which was observed among those ages 35-39 years. Likewise, men in the general population are at a greater risk of developing HNC, which also applies to the military, as male service members had an IR 1.7 times that of female service members.

The 2021 study conducted determined the incidence of oral cavity and pharynx cancer among ACSMs from 2007 through 2019.[15] While the present study expanded the 2021 study to include cancer in all

FIGURE 2. Ten Most Frequent Sites of Head and Neck Cancer, by Percentage of Total Cases, U.S. Active Component Service Members, 2010–2024



locations considered HNC, in addition to the oral cavity and pharynx, very similar results were found. As with the present study, the 2021 investigation determined that the branch of service, sex, and age group with the highest IRs included the Army, men, and those ages 40 years and older.[15] Furthermore, the most common diagnosed site in both studies was the parotid gland.[15]

The difference in IRs among the service branches may be due to the differing age distributions among them, as also suggested in the 2021 study.[15] Service members with the greatest risk of HNC were those ages 40 years and older. The Marine Corps had the lowest overall HNC IR. Likewise, the proportion of service members ages 40 years or older is lowest in the Marine Corps (4.9%). Notably, this proportion is at least 2 times lower than that of any other service branch, ranging from 9.9% in the Air Force to 18.3% in the Coast Guard (DMED).

The small number of cases in this study precluded meaningfully stratified analysis due to limited statistical power to separate true trends from random fluctuations. The reliance on de-identified medical encounter data presented with additional limitations. Cancer diagnoses could not be independently verified, and thus, the results could be subject to misclassification errors leading to either an over- or underestimation of cases. Individual risk factors could not be linked to diagnoses; differences in known contributing risk factors (e.g., tobacco and alcohol use, HPV infection) may explain the differences in IRs among the service branches. The Army had the highest IR, 2.5 times that of the Marine Corps, which might suggest higher rates of contributing risk factors in the Army. According to the *2018 Health Related Behavior Survey*, however, both binge and heavy drinking were the highest among Marine Corps and Navy members.[16] Furthermore, Marine Corps members were more likely to be current cigarette smokers, electronic cigarette smokers, and smokeless tobacco users compared to service members of all other branches.[16]

Certain military service members are subject to an added environmental hazard associated with HNC: burn pit exposure. The Department of Veterans Affairs has recognized HNC, in addition to various other cancers, as a "presumptive cancer" related to burn pit exposure among those who served in Iraq, Afghanistan, or certain other areas.[17] As such, these individuals may be eligible for disability compensation.[17]

Risk of developing HNC is related to prolonged, repeated exposure to the known risk factors; this type of cancer can take years, even decades, to develop.[3,4,8-12] Considering that HNC diagnosis may not occur until long after a service member has left service, numerous studies have evaluated HNC among the veteran population. Unfortunately, the prevalence of HNC among veterans is nearly twice that of the general population.[18-21] Factors believed to contribute to this are the high rates of tobacco and alcohol use among this population, as well as low rates of HPV vaccination,[22-26] which may not have been an option for some veterans, depending upon their ages.

HNC represents a small portion of the overall disease burden among ACSMs compared to other cancers such as breast cancer or melanoma.[14] The significance of such a debilitating, albeit uncommon, disease should not be discounted, however. Early detection is paramount to improving prognosis, as is educating patients regarding the signs, symptoms, and risk factors for HNC.[27,28] Military dentists contribute significantly to early detection. ACSMs are required to have a yearly dental examination which provides dentists with the opportunity to not only educate ACSMs about HNC but evaluate them for suspicious lesions in the head and neck region. This is consistent with the American Dental Association's "Early Detection and Prevention of Oral and Oropharyngeal Cancer" policy, which recommends cancer prevention education and a routine visual and tactile examination for all patients.[27] Nevertheless, given the implications of early detection, regular self-examinations for signs of HNC are equally vital.

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Disclaimers
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Brief Report

Incidence of Oropharyngeal Cancer Among U.S. Active Component Service Members, 2005–2024

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Oropharyngeal cancer develops in the oropharynx, which is comprised of the soft palate, side and back walls of the throat, tonsils, and back of the tongue.[1] Oropharyngeal cancer is distinguished from cancers arising in the oral cavity and pharynx, otherwise known as head and neck cancers, which include the lip, salivary glands, mouth and gums, and entire throat (or pharynx) and tongue.[2]

Oropharyngeal cancer comprises 2 distinct cancers, HPV-positive and HPV-negative types, with different risk factors and age distributions. It is estimated that 60-70% of oropharyngeal cancers in the U.S. are due to infections with high-risk types of human papillomavirus (HPV), with smoking and heavy alcohol use acting as important risk factors for HPV-negative types.[3] HPV-positive cancers tend to be diagnosed in people younger than age 50 years, whereas HPV-negative types tend to be diagnosed among older individuals.[4] In addition, HPV-positive oropharyngeal cancers tend to have better prognosis and respond better to treatment.[5] The first HPV vaccine became available in the U.S. for women ages 9-26 years in 2006.[6] A bivalent vaccine became available in 2009, and a 9-valent vaccine became available for women and men in 2014.[6]

Despite the availability of the HPV vaccine over the past 20 years, data published in 2025 indicate that incidence of oropharyngeal cancer in the U.S. increased slightly between 2006 and 2022, primarily among men and older individuals.[7] A previous study by the Murtha Cancer Center compared incidence rates of oral cavity and oropharyngeal cancers among active duty service men and men in the U.S. population between 1990 and 2013.[8] That study found that active duty incidence rates of oropharyngeal cancer were higher than U.S. population rates among non-Hispanic White individuals (IRR 1.19, 95% CI 1.01, 1.39) and men ages 40-59 years (IRR 1.18, 95% CI 1.00, 1.39), and rates increased for both populations over time.[8]

Continued oropharyngeal cancer surveillance among U.S. service members was identified as a gap by the DHA public health cancer surveillance community of interest, and a new surveillance case definition for oropharyngeal cancer was created. This analysis represents the first use of the new case definition. This study aimed to examine the trend in annual incidence of oropharyngeal cancer among U.S. active component service members (ACSMs), a comparatively young and healthy population, from 2005 through 2024.

Methods

Data for this study were obtained from the Defense Medical Surveillance System (DMSS), a relational database that documents military and medical data for U.S. service members throughout their military careers. Incident cases of oropharyngeal cancer were identified by the presence of a single inpatient encounter with a qualifying diagnosis in the first diagnostic position (International Classification of Diseases, 9th Revision, Clinical Modification [ICD-9-CM]: 141.0, 141.5, 141.6, 141.8 141.9, 145.3-145.5, 146.0-146.2, 146.3-146.9, 149.0, 149.1, 149.8; International Classification of Diseases, 10th Revision, Clinical Modification [ICD-10-CM]: C01, C02.4, C02.8, C02.9, C05.1, C05.2, C05.8, C05.9, C09.0, C09.1, C09.9, C09.9, C10*, C14.0, C14.2, C14.8), or a 'V'- or 'Z'- treatment code (ICD-10-CM: Z51.0, Z51.1, Z51.11, Z51.12; ICD-9-CM: V58.0, V58.1, V58.11, V58.12) in the first diagnostic position and a qualifying diagnosis in the second diagnostic position, or with 3 or more outpatient encounters in a 90-day period with a qualifying diagnosis in the first or second diagnostic position. An individual was counted as an incident case only once per lifetime. Person-time was counted in years of active component service and was censored at the date of incident diagnosis. Multivariable Poisson regression models were used to calculate adjusted incidence rate ratios for service branch, rank, and military occupation, after controlling for age, sex, and racial and ethnic group.

Results

From 2005 through 2024, 341 new cases of malignant oropharyngeal cancer were diagnosed among U.S. ACSMs, corresponding to an incidence rate (IR) of 1.27 cases per 100,000 person-years (p-yrs) **(Table 1)**. There was no clear increase or decrease in annual incidence observed during the surveillance period **(Figure)**. Instead, IRs fluctuated between a low of 0.79 cases per 100,000 p-yrs in 2023 and high of 1.87 cases per 100,000 p-yrs in 2014. The most common anatomical site of incident diagnosis was the tonsil (n=94, 28%), followed by other and unspecified parts of the tongue (n=85, 25%), oropharynx (n=76, 22%), base of the tongue (n=54, 16%), ill-defined sites of lip, oral cavity and pharynx (n=20, 6%), and soft palate (n=12, 3.5%) (data not shown).

Incidence of oropharyngeal cancer was 6 times higher in male ACSMs compared to female ACSMs, with rates increasing significantly with increasing age **(Table 1)**. Non-Hispanic White ACSMs had the highest rate, compared to the other known racial and ethnic groups. Compared to other service branches, ACSMs in the Marine Corps had the lowest rate, and Army members had the highest rate, which remained true even after adjustment for age, sex, and race and ethnicity **(Table 2)**. Officers had a higher crude incidence compared to enlisted members; however, this was no longer true in the adjusted analysis. Pilots and air crew had the highest crude IRs compared to other occupations, but ACSMs in motor transport occupations had the highest adjusted rates.

TABLE 1. Incident Cases and Rates of Diagnoses for Malignant Oropharyngeal Cancer, U.S. Active Component Service Members, 2005–2024

	No.	Rate[a]
Total	341	1.3
Sex		
Male	331	1.5
Female	10	0.2
Branch of service		
Army	160	1.6
Navy	76	1.2
Air Force, Space Force	88	1.3
Marine Corps	17	0.5
Race and ethnicity		
White, non-Hispanic	254	1.6
Black, non-Hispanic	27	0.6
Hispanic	26	0.7
Other	25	1.0
Unknown	9	1.7
Age, *y*		
17–24	17	0.2
25–29	23	0.4
30–34	37	0.9
35–39	56	1.8
40–44	94	5.3
45–49	61	8.7
50–54	34	16.1
55–59	15	30.6
60+	4	46.4
Military rank		
Enlisted	209	0.9
Officer	132	2.9
Military occupation	.	.
Combat-related	51	1.3
Motor transport	11	1.4
Pilot, air crew	20	2.0
Repair, engineering	85	1.1
Communications, intelligence	63	1.1
Health care	43	1.9
Other	68	1.3

Abbreviations: No., number; *y*, years.
[a] Rates per 100,000 person-years.

Discussion

The demographic and time trends of oropharyngeal cancer incidence among ACSMs observed in this analysis are similar to the findings from a 2021 *MSMR* report on oral cavity and pharynx cancers, with men and older service members showing higher rates of diagnosis.[2] Unlike trends observed in the U.S. during a similar period, annual IRs in ACSMs did not increase over time—but there was no obvious decrease. Overall oropharyngeal cancer incidence in the U.S. is not expected to be affected significantly by the HPV vaccine until 2045, as older individuals who did not receive an HPV vaccine will remain at increased risk until then.[6,9]

In the U.S., oropharyngeal cancer rates are slightly higher among non-Hispanic White individuals compared to other racial and ethnic groups, which was consistent with this report's findings among ACSMs.[10, 11] One hypothesized reason for this trend includes varying oral sexual behaviors, which are associated with high-risk HPV infection, among different racial and ethnic groups.[12] Other potential hypotheses include birth cohort effects, varied levels of smoking behaviors, as well as socio-economic factors and access to health care.[12] This study did not intend to compare oropharyngeal incidence rates to the U.S. population. It would not be appropriate to use the findings of this study to compare to the U.S. population due to differences in case ascertainment methodology and underlying population differences. Instead, the intent of this study was to evaluate internal trends of oropharyngeal cancer within the active component U.S. military. Limitations of this study included the fact that annual incidence trends could not be evaluated among subgroups by sex or age due to the small number of cases identified during the long surveillance period. In addition, data on risk and protective factors including alcohol use, smoking, and full HPV vaccination history were not available.

Oropharyngeal cancer is rare among ACSMs, likely due to the fact it is a cancer primarily affecting older age groups, with an average age of onset age 64 years.[13] Because 20% of oropharyngeal cancers are estimated to occur in individuals younger than age 55 years, however, continued surveillance of population cancer rates is recommended to determine the evolving impacts of vaccination and changing lifestyle factors.[13] Surveillance of cancer trends is necessary for maintaining a fit and medically ready military fighting force, ensuring long-term operational effectiveness, and helping to identify service-related environmental trends or risk factors.

FIGURE. Incidence Rates of Oropharyngeal Cancer, U.S. Active Component Service Members, 2005–2024

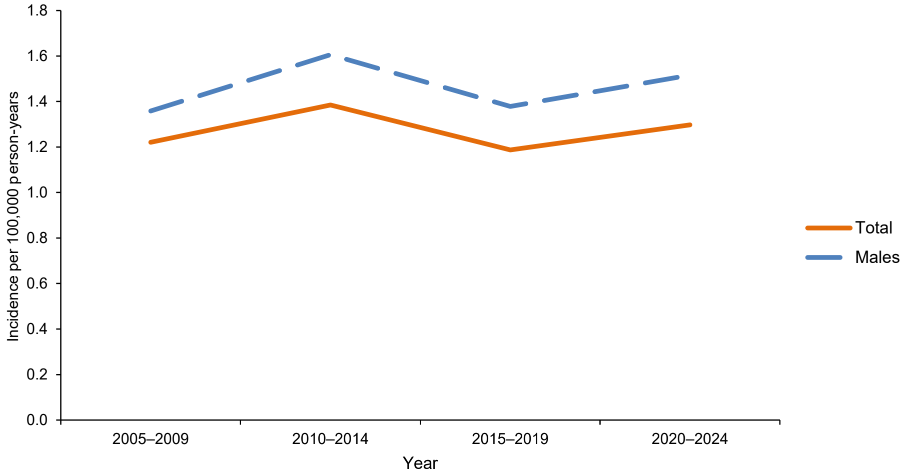

TABLE 2. Crude and Adjusted Rate Ratios for Oropharyngeal Cancer, U.S. Active Component Service Members, 2005–2024

	Crude	Adjusted[a]	
Branch of service	IRR	IRR	*p*-value
Army	Reference	Reference	Reference
Navy	0.7	0.7	0.0
Air Force, Space Force	0.8	0.8	0.2
Marine Corps	0.3	0.5	<0.01
Military rank			
Enlisted	Reference	Reference	Reference
Officer	3.0	0.9	0.2
Military occupation			
Combat-related	0.7	1.4	0.2
Motor transport	0.7	2.2	0.0
Pilot, air crew	Reference	Reference	Reference
Repair, engineering	0.5	1.2	0.4
Communications, intelligence	0.5	1.1	0.7
Health care	0.9	1.3	0.3
Other	0.6	1.2	0.4

Abbreviation: IRR, incidence rate ratio.
[a] Adjusted for age category, sex, and racial and ethnic group.

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Reportable Medical Events at Military Health System Facilities Through Week 1, Ending January 3, 2026

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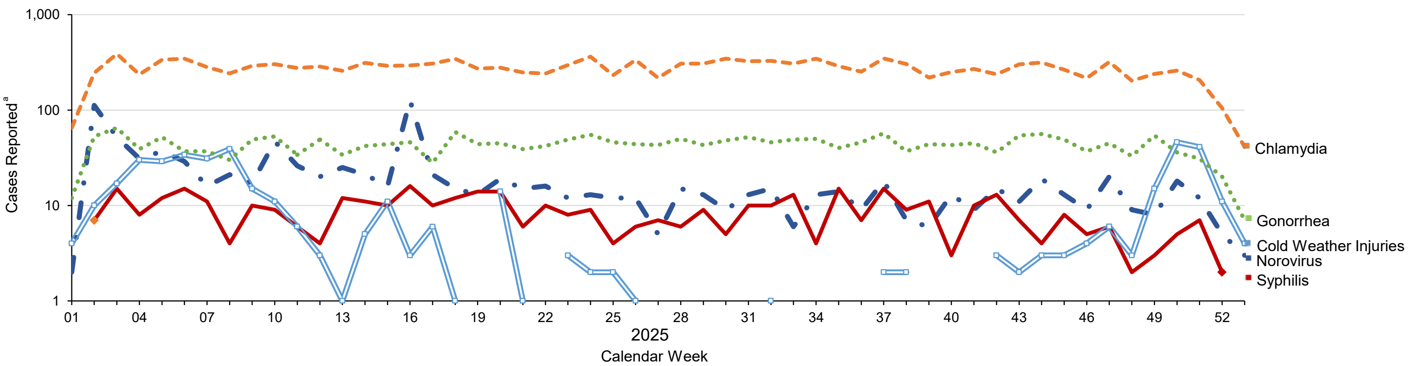
TOP 5 REPORTABLE MEDICAL EVENTS BY CALENDAR WEEK, U.S. ACTIVE COMPONENT, JANUARY 1, 2025–DECEMBER 31, 2025



Abbreviation: RMEs, reportable medical events.

[a]Cases are shown on a logarithmic scale.

Note: There were 0 reported cold weather injury cases during weeks 19, 22, 27–31, 33–36, and 39–41 of 2025. There were 0 reported syphilis cases during weeks 1 and 53 of 2025.

Reportable Medical Events (RMEs) are documented in the Disease Reporting System internet (DRSi) by health care providers and public health officials throughout the Military Health System (MHS) for monitoring, controlling, and preventing 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 on 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 considered 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 (December 2025) 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.

For questions about this report, please contact the Disease Epidemiology Branch at the Defense Centers for Public Health–Aberdeen. Email: dha.apg.pub-health-a.mbx.disease-epidemiologyprogram13@health.mil

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TABLE. Reportable Medical Events, Military Health System Facilities,December 2025[a]

Reportable Medical Event[b]	Active Component[c]					MHS Beneficiaries[d]
	December 2025	November 2025	YTD 2025	YTD 2024	Total 2024	December 2025
	No.	No.	No.	No.	No.	No.
Amebiasis	0	1	15	15	15	1
Arboviral diseases, neuroinvasive, non-neuroinvasive	0	0	3	4	4	0
Babesiosis	0	0	1	0	0	0
Brucellosis	0	0	0	1	1	0
COVID-19-associated hospitalization, death	1	1	33	41	41	7
Campylobacteriosis	16	30	337	326	326	13
Chikungunya virus disease	0	0	0	1	1	0
Chlamydia trachomatis infection	848	1,020	14,478	16,097	16,097	127
Cholera O1, O139	0	0	0	3	3	0
Coccidioidomycosis	1	2	23	53	53	1
Cold weather injury[e,f]	116	17	425	174	174	N/A
Cryptosporidiosis	3	3	65	82	82	2
Cyclosporiasis	0	0	22	11	11	0
Dengue virus infection	0	0	9	12	12	0
E. coli, Shiga toxin-producing	1	2	62	93	93	3
Ehrlichiosis, anaplasmosis	0	0	2	1	1	1
Giardiasis	2	8	100	98	98	2
Gonorrhea	146	166	2,278	2,823	2,823	11
H. influenzae, invasive	0	0	2	3	3	0
Heat illness[e]	15	25	1,408	1,276	1,276	N/A
Hepatitis A	0	0	2	7	7	0
Hepatitis B, acute, chronic[g]	6	2	79	108	108	5
Hepatitis C, acute, chronic	1	2	27	35	35	4
Influenza-associated hospitalization[h]	13	4	66	54	54	40
Lead poisoning, pediatric[i]	N/A	N/A	N/A	N/A	N/A	4
Legionellosis	0	1	2	5	5	0
Leishmaniasis	0	0	1	0	0	0
Leprosy	0	0	0	2	2	0
Listeriosis	0	0	1	0	0	0
Lyme disease	1	4	97	101	101	0
Malaria	1	0	31	21	21	0
Meningococcal disease	0	0	2	2	2	0
Mpox	0	1	10	14	14	1
Mumps	0	0	2	0	0	0
Norovirus infection[j]	46	51	1,053	654	654	70
Pertussis	3	1	42	39	39	6
Q fever	0	0	1	3	3	0
Rabies post-exposure prophylaxis (PEP)	31	48	631	637	637	25
Salmonellosis	4	8	160	160	160	7
Schistosomiasis	0	0	0	1	1	0
Shigellosis	2	4	41	53	53	2
Spotted fever rickettsiosis	3	2	40	22	22	2
Syphilis[k]	17	21	439	588	588	7
Toxic shock syndrome	0	0	0	2	2	0
Trypanosomiasis	0	0	2	5	5	0
Tuberculosis	0	0	9	6	6	0
Tularemia	0	0	2	1	1	0
Typhoid fever	0	0	0	1	1	0
Typhus fever	1	1	10	2	2	0
Varicella	1	0	15	18	18	1
Zika virus infection	0	0	0	1	1	0
Total case counts	1,279	1,425	22,028	23,656	23,656	342

Abbreviations: MHS, Military Health System; YTD, year-to-date; No., number; N/A, not applicable; *E., Escherichia*; *H., Haemophilus*; PEP, post-exposure prophylaxis; DRSi, Disease Reporting System internet; DCPH-A, Defense Centers for Public Health–Aberdeen.

[a] RMEs submitted to DRSi as of Mar. 10, 2026. RMEs were classified by date of diagnosis or, where unavailable, date of onset. Monthly comparisons are displayed for the periods Nov. 1, 2025–Nov. 30, 2025 and Dec. 1, 2025–Dec. 31, 2025. YTD comparison is displayed for the period Jan. 1, 2025–Dec. 31, 2025 for MHS facilities. Previous year counts are provided as: previous YTD, Jan. 1, 2024-Dec. 31, 2024; total 2024, Jan. 1, 2024–Dec. 31, 2024.

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

[c] Services included in this report include the Army, Navy, Air Force, Marine Corps, Coast Guard, and Space Force, including personnel classified as active duty, cadet, midshipman, or recruit in DRSi.

[d] Beneficiaries included the following: individuals classified as Retired and Family Members (including Spouse, Child, Other, and Unknown). National Guard, Reservists, civilians, contractors, and foreign nationals were excluded from these counts.

[e] Only reportable for service members.

[f] There was a 144% increase in DRSi reports for cold weather injury in YTD 2025 (n=425) compared to YTD 2024 (n=174).

[g] The observed decrease in hepatitis B cases from 2024 to 2025 may be, in part, attributed to updated case validation process.

[h] Influenza-associated hospitalization is reportable only for individuals under age 65 years.

[i] Pediatric lead poisoning is reportable only for children ages 6 years or younger.

[j] DCPH-A is closely monitoring norovirus, due to a 61% increase in DRSi reports for norovirus in YTD 2025 (n=1,053) compared to YTD 2024 (n=654).

[k] The observed drop in syphilis cases from 2024 to 2025 may be, in part, attributed to updated case validation process that began Jan. 2024.

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