

THYROID CANCER

Includes invasive cancer only. Does not include carcinoma in situ or metastatic cancer.

Background

This case definition was developed by the Armed Forces Health Surveillance Division (AFHSD) for the purpose of descriptive epidemiological reports on invasive cancers among active duty Service members.¹ The case definition uses the “standard” AFHSD oncology case definition.

Clinical Description

Thyroid cancer is a malignancy in the parenchymal cells of the thyroid gland. There are two main cell types, differentiated thyroid cancer (DTC) and medullary thyroid carcinoma (MTC). Differentiated thyroid cancer includes papillary thyroid cancer, the most common form, follicular thyroid cancer and Hurthle cell cancer; together these account for 90-95% of all thyroid malignancies.² The condition typically presents with swelling of the neck, or a thyroid nodule incidentally detected on clinical exam or neck imaging. The majority of thyroid nodules are benign; the risk of malignancy in the general population is approximately 5-10%. Evaluation includes a thyroid function panel, ultrasound evaluation, and fine-needle aspiration biopsy for highly suspicious lesions. Surgical resection followed by radioiodine ablation is the main treatment for cancerous lesions. Risk factors include female sex, family history and radiation exposure of the thyroid gland during childhood. Prognosis for most cell types is excellent with a 5-year survival rate of 97%.³

Case Definition and Incidence Rules (March 2025 - present)

For surveillance purposes, a case of thyroid cancer is defined as:

- *One hospitalization* with a case defining diagnosis of thyroid cancer (see ICD9 and ICD10 code lists below) in the *first* diagnostic position; or
- *One hospitalization with a procedure code* indicating radiotherapy, chemotherapy, or immunotherapy treatment (see ICD9 and ICD10 code lists below) in the *first* diagnostic position; AND a case defining diagnosis of thyroid cancer (see ICD9 and ICD10 code lists below) in the *second* diagnostic position; or
- *Three or more outpatient medical encounters*, occurring within a 90-day period, with a case defining diagnosis of thyroid cancer (see ICD9 and ICD10 code list below) in the *first or second* diagnostic position.

(continued on next page)

¹ Armed Forces Health Surveillance Center. Incident diagnoses of cancers and cancer-related deaths, active component, U.S. Armed Forces, 2005-2014. *MSMR* 2016; July; 23(7): 23-31.

² American Cancer Society. Cancer Facts & Figures 2024. Available at: <https://www.cancer.org/research/cancer-facts-statistics.html>. Accessed March 2025.

³ Lee K, Anastasopoulou C, Chandran C, et al. Thyroid Cancer. [Updated 2023]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459299>. Accessed March 2025.



Case Definition and Incidence Rules *(continued)*

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization or outpatient medical encounter that includes a case defining diagnosis of thyroid cancer.
- An individual is considered an incident case *once per lifetime*.

Exclusions:

- None

Codes

The following ICD9 and ICD10 codes are included in the case definition:

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Thyroid cancer	C73 (malignant neoplasm of thyroid gland) <i>*There are no cell-type specific ICD10 codes.</i>	193 (malignant neoplasm of thyroid gland)

Procedures	ICD-10-CM Codes	ICD-9-CM Codes
Related treatment procedures <i>(Radiotherapy, chemotherapy, immunotherapy)</i>	Z51.0 (encounter for antineoplastic radiation therapy)	V58.0 (radiotherapy)
	Z51.1 (encounter for antineoplastic chemotherapy and immunotherapy)	V58.1 (encounter for chemotherapy and immunotherapy for neoplastic conditions)
	- Z51.11 (encounter for antineoplastic chemotherapy)	- V58.11 (encounter for antineoplastic chemotherapy)
	- Z51.12 (encounter for antineoplastic immunotherapy)	- V58.12 (encounter for antineoplastic immunotherapy)

Development and Revisions

- This case definition was developed in March 2025 by the Defense Health Agency (DHA) Health Surveillance & Epidemiology (HSE) cancer surveillance Sub Working Group (SubWG). The case definition was developed based on reviews of the ICD10 codes, the scientific literature and previous AFHSD analyses.



- In 2024, the DHA HSE cancer surveillance SubWG evaluated and expanded the list of cancers in the AFHSD cancer report to include breast (female), bladder, brain, cervical, colorectal, kidney (renal), leukemia, liver (hepatic), lung/bronchial, non-Hodgkin lymphoma, ovarian, pancreatic, prostate, stomach (gastric) and testicular cancer.
- In a 2019 *Monthly Surveillance Medical Report (MSMR)* article, analysis of the AFHSD standard oncology case revealed the definition had a high positive predictive value (PPV) for capturing cases of common cancers, (e.g., breast, prostate, testicular), and a low-to-moderate PPV for rarer cancers, (e.g., gallbladder, intestinal, laryngeal). Analyses also revealed the case definition was less sensitive for identifying cancers of the brain and nervous system, lung and bronchus, bones and joints, and liver ($PPV \leq 50$ percent); these cases often represented metastases rather than true incident cases. While the broad application of a single case definition may affect the sensitivity and specificity in varying ways for the individual cancers, the PPV for all the cancers included in the report are >70 percent, and most have a $PPV \geq 90$ percent.⁴
- The standard AFHSD oncology case definition was originally developed in 2011 by the Armed Forces Health Surveillance Center (AFHSC) in collaboration with a working group of subject matter experts from the Office of the Assistant Secretary of Defense for Health Affairs (ASDHA), the United States Army Public Health Command (USAPHC) and the United States Military Cancer Institute for a report on 10 different *invasive* cancers. The case definition was developed based on reviews of the ICD9 codes, the scientific literature and previous AFHSC analyses.

Case Definition and Incidence Rule Rationale

- In the 2019 *MSMR* article, cases of “other endocrine” cancers identified using the standard AFHSD oncology case definition had a total PPV of 75.0 percent [CI 50.9-91.3]: female 50.0 percent [CI 6.8-93.2], male 81.3 percent [CI 54.4-96.0].⁴
- The case finding criteria of *three or more outpatient medical encounters, within a 90-day period*, is used to identify cases that do not meet the other criteria in the definition. Exploratory analysis of Defense Medical Surveillance System (DMSS) data revealed this criterion yielded optimal specificity.⁵
 - A period of 90 days allows for the likelihood that “true” cases of thyroid cancer will have second and third encounters within that timeframe. The timeframe is based on the following standards of care: (1) following a biopsy of a clinically suspicious nodule, the average time to obtain a pathology report and definitive diagnosis is 1-3 weeks; (2) individuals whose biopsy results are positive for thyroid cancer are likely to have a follow-up visit for treatment within 4 weeks of a definitive diagnosis; and (3) individuals are likely to have follow-up visits to monitor clinical indicators of disease within the 90-day timeframe.⁶
 - For outpatient encounters, the incident date is considered the first of the three encounters occurring within the 90-day period, (e.g., if an individual has four thyroid cancer codes on 1-Jan-12, 1-Dec-15, 8-Dec-15, and 15-Dec-15, the incident date would be 1-Dec-15; 1-Jan-12 would be considered a screening encounter and dropped).
- To maintain consistency with the standard AFHSD methodology for surveillance of invasive cancers, AFHSD uses a *once per lifetime* incidence rule. The workgroup recognizes individuals,

⁴ Webber, B, Rogers, A, Pathak, S, Robbins, A. Positive Predictive Value of an Algorithm Used for Cancer Surveillance in the U.S. Armed Forces. *MSMR* 2019; 26(12):18-23.

⁵ Detailed information on these analyses is available through AFHSD; reference DMSS Requests #R230308, #R230378 and #R240009.

⁶ Thyroid cancer. National Comprehensive Cancer Network (NCCN) Guidelines Version 2.2023. <https://www.nccn.org/guidelines/recently-published-guidelines>. Accessed March 2025.



may be considered disease free after treatment or after an extended period of time, (e.g., 5 years), with no clinical evidence of disease. Individuals who develop a recurrence after being disease free could, theoretically, be counted as a new incident case. However, for surveillance of cancer using administrative, (i.e., billing), data, it is difficult to identify individuals who are disease free after treatment.

Code Set Determination and Rationale

- Procedure codes (ICD10 and CPT) indicating surgical treatment of individual cancers such as hysterectomy, mastectomy, prostatectomy, and other procedures unique to certain types of cancers are not included in the code set. While procedure codes may increase the specificity of case finding criteria in select circumstances, analyses can be labor intensive and the effort does not necessarily guarantee a better case definition, (i.e., the definition may still identify false positive cases).
- *Screening for disease* codes ICD10 Z12.xx / ICD9 V76.xx (encounter for screening for malignant neoplasms) are not included in the code set. Screening codes are used for “testing for disease or disease precursors in seemingly well individuals so that early detection and treatment can be provided for those who test positive for the disease, (e.g., screening mammogram).”⁷ They would not be used for follow-up medical encounters of a specific disease.
- *Personal history of malignant neoplasms* (ICD10 Z85.xx) codes are not included in the code set. While these codes may be beneficial for identifying individuals with a history of cancer, analysis of administrative data reveal these codes lack the specificity to count incident cancer cases and are inconsistently used by providers.⁸ Given these findings, the AFHSD does not use personal history codes to exclude prevalent cases, (i.e., individuals with a history of cancer), nor to identify individuals who are disease free after treatment.

Personal history codes are intended to be used by providers for individuals who have a history of cancer *and* documented evidence in the medical record that the malignancy has been “excised or eradicated and all treatment is complete.” They are not used for a “self-reported” history of malignancy, and they should be used in conjunction with ICD10 codes for follow-up visits (Z08- encounter for follow-up examination after completed treatment for a malignant neoplasm), aftercare visits (Z51.0 - encounter for antineoplastic radiation therapy; Z51.1- encounter for antineoplastic chemotherapy and immunotherapy), and screening visits (Z12 - encounter for screening for malignant neoplasms).⁹

Reports

The AFHSD reports on thyroid cancer in the following reports:

- Periodic *MSMR* articles.

⁷ ICD-10-CM Official Guidelines for Coding and Reporting. FY 2022–Updated April 1, 2022. (October 1, 2021–September 30, 2022. <https://stacks.cdc.gov/view/cdc/126426>. Accessed March 2025.

⁸ Analysis performed by the Defense Centers of Public Health-Dayton. Encounters with at least one Z85.x code in any diagnostic position (dx1- dx20) were pulled from Comprehensive Ambulatory Professional Encounter Records (CAPER) and Standard Inpatient Data Records (SIDR) for all Tri-Service beneficiaries between October 2016 and March 2024. A total of 546,962 encounters were identified. Of these, 68,395 (13%) had at least one neoplasm diagnosis (ICD10 C00-D49). With administrative data, there is no way to determine if the neoplasm codes refer to a resolved malignancy or a new cancer diagnosis. Records with conjunction codes for follow-up (Z08), aftercare (Z51.[0.1]) and screening (Z12) were queried: 420,236 (77%) had no conjunction codes in any diagnostic position suggesting providers use personal history codes independent of the purpose of the visit and potentially inconsistently.

⁹ Bredehoeft, Emily. Clear Up Confusion as to When Cancer Becomes “History Of.” American Academy of Professional Coders (AAPC). <https://www.aapc.com/blog/40016-clear-up-confusion-as-to-when-cancer-becomes-history-of/>. Accessed March 2025.



Review

Mar 2025	Case definition reviewed and adopted by the AFHSD Surveillance Methods and Standards (SMS) working group.
Mar 2025	Case definition developed by the DHA HSE cancer surveillance SubWG.

Comments

- *In situ cancer*: The code set for “carcinoma in situ of thyroid and other endocrine glands” includes the following codes (D09.3). The AFHSD uses the standard oncology case definition for surveillance of in situ cancers and is in the process of developing definitions for select in situ cancers.
 - [D09.3](#) Carcinoma in situ of thyroid and other endocrine glands

