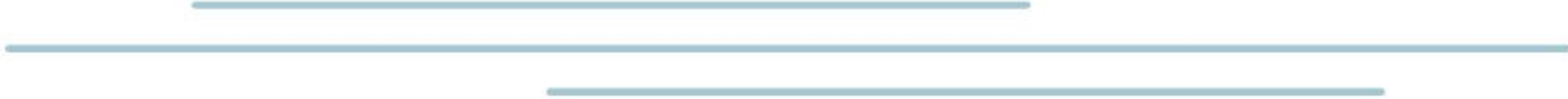


07/17/2026



Dental Care for Patients with Cancer

Gary Klasser, DMD



Disclaimer

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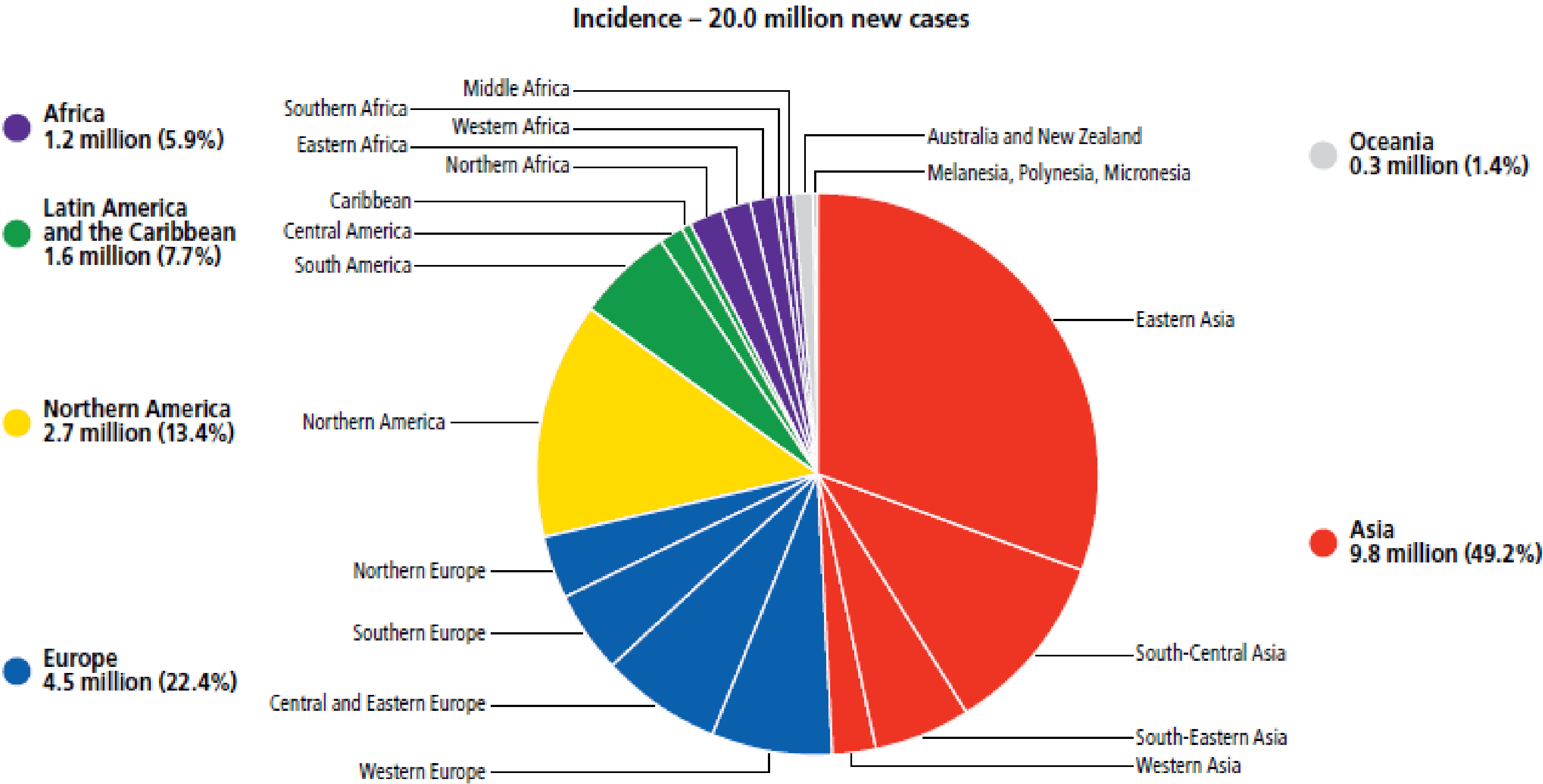
Objectives

- Appreciate the epidemiology of cancer + specifically, head + neck cancer
- Recognize the consequences of cancer therapies on oral health
- Understand that dental health is critical for the cancer patient

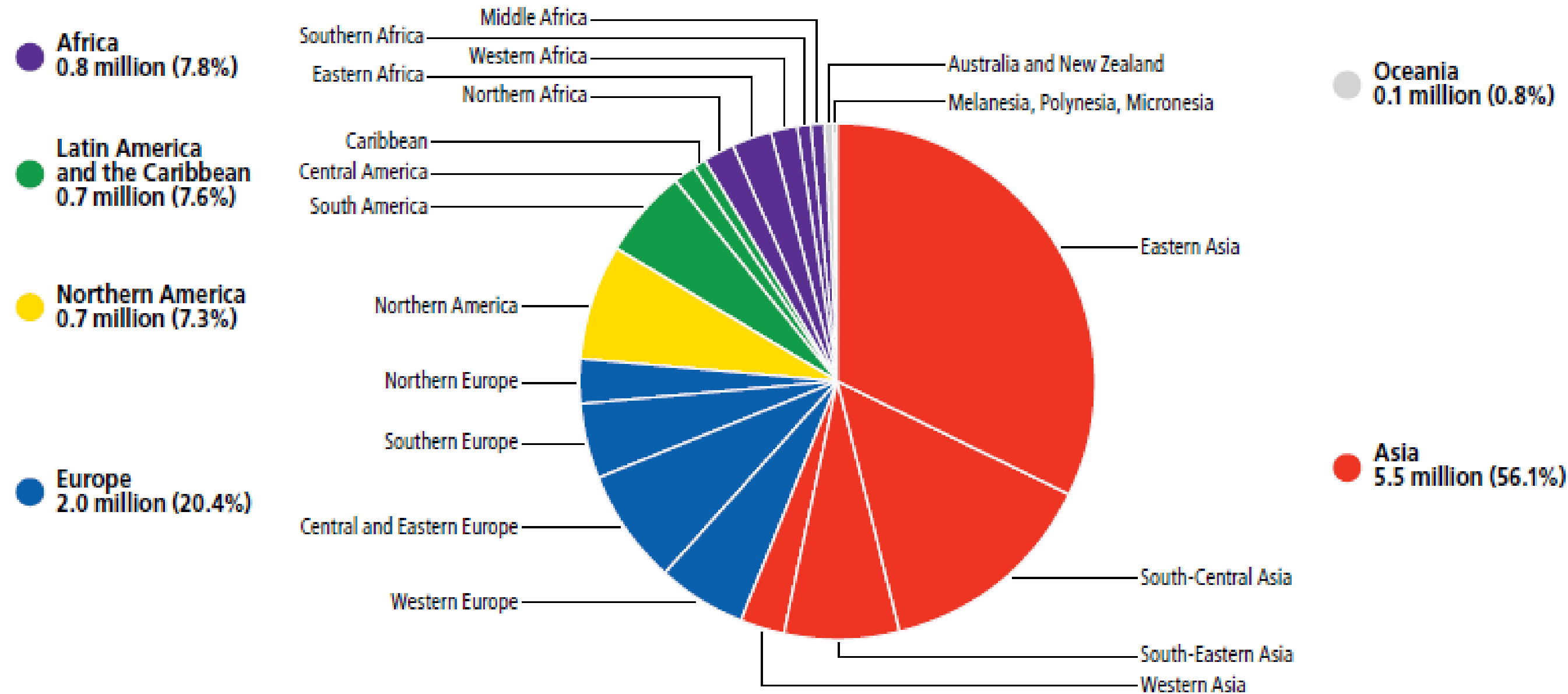
What is Cancer?

- Cancer is a group of diseases characterized by the uncontrolled growth + spread of abnormal cells that can result in death if untreated
- The cause of most cancers is unknown, but certain lifestyle factors + inherited genetic mutations can increase risk, either by acting alone or in combination, to initiate and/or promote cancer growth

Figure 1. Estimated Number of New Cancer Cases and Deaths by World Regions, 2022



Mortality – 9.7 million deaths

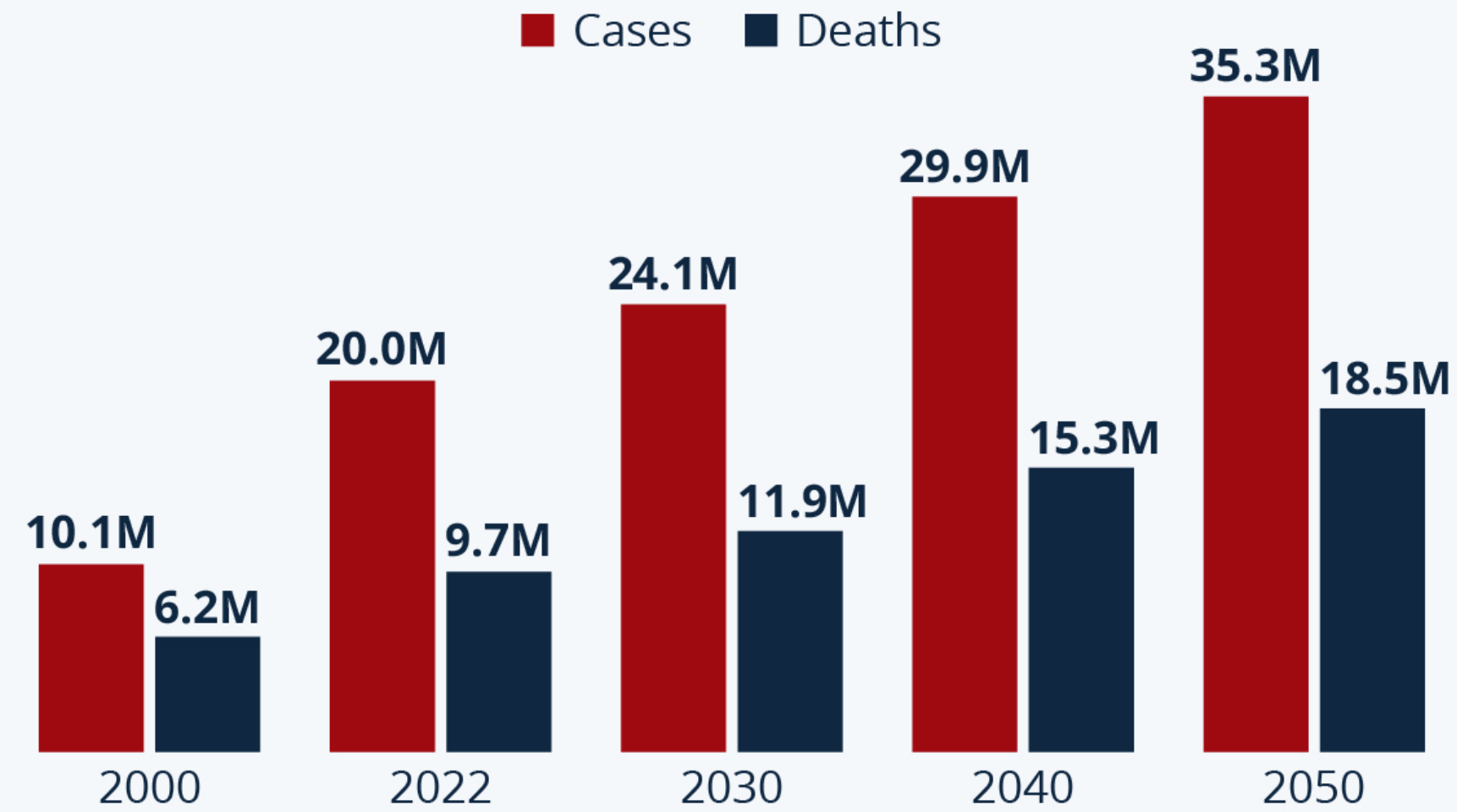


Note: Region estimates do not sum to the worldwide estimate due to rounding.

Source: GLOBOCAN 2022 (gco.iarc.fr/today/).

The Global Cancer Burden Keeps Growing

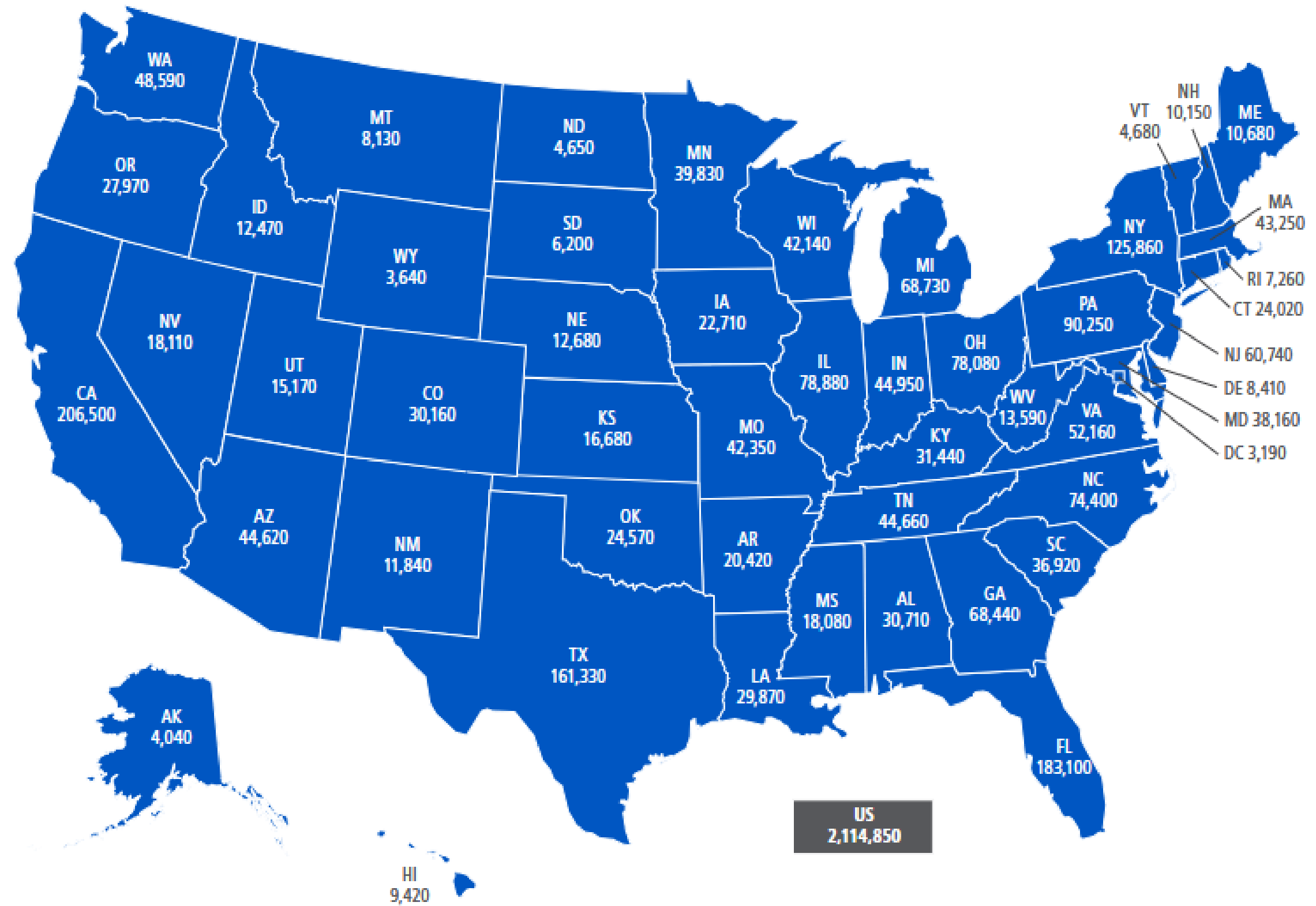
Estimated number of new cancer cases and deaths worldwide per year



Source: International Agency for Research on Cancer



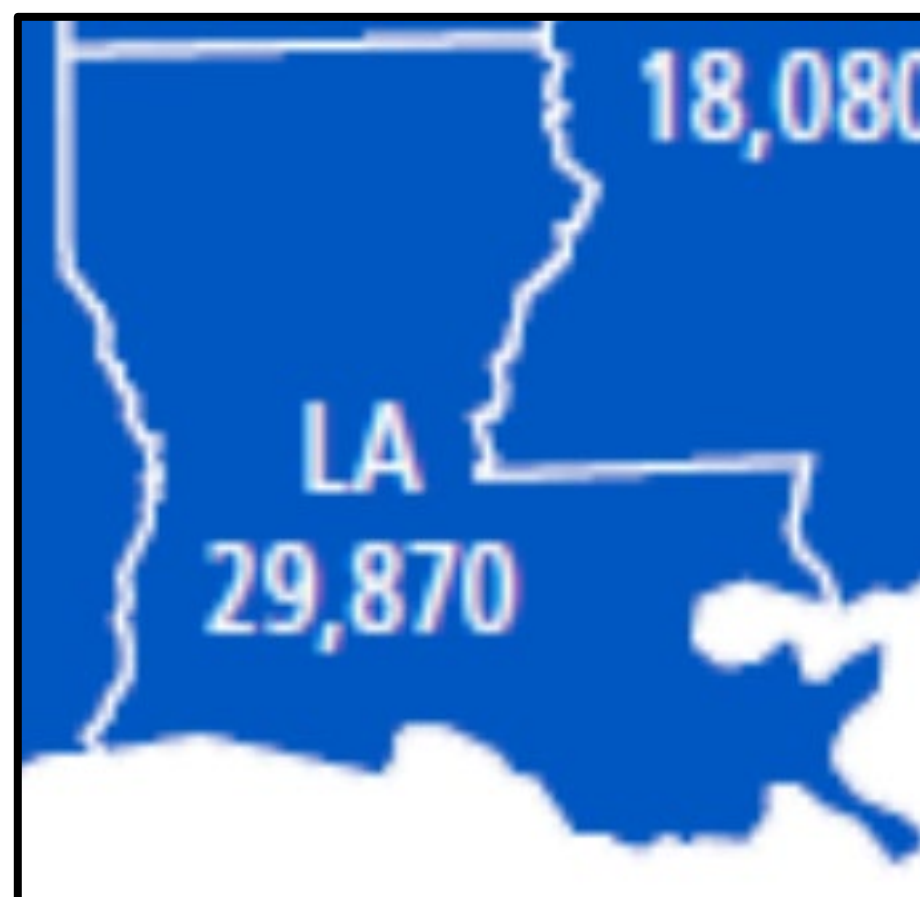
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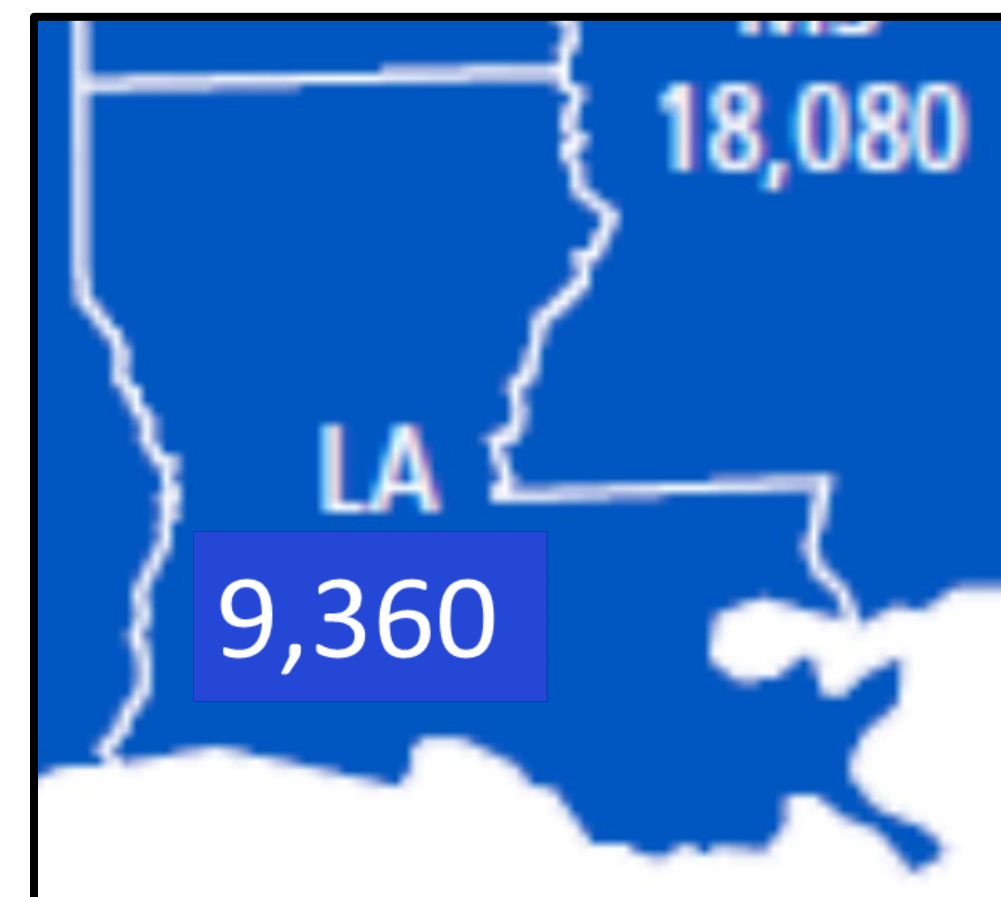
Estimated number of new cases in 2026, excluding basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder.
 Estimates are model based projections and should be interpreted with caution.

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Estimated number of new cases 2026

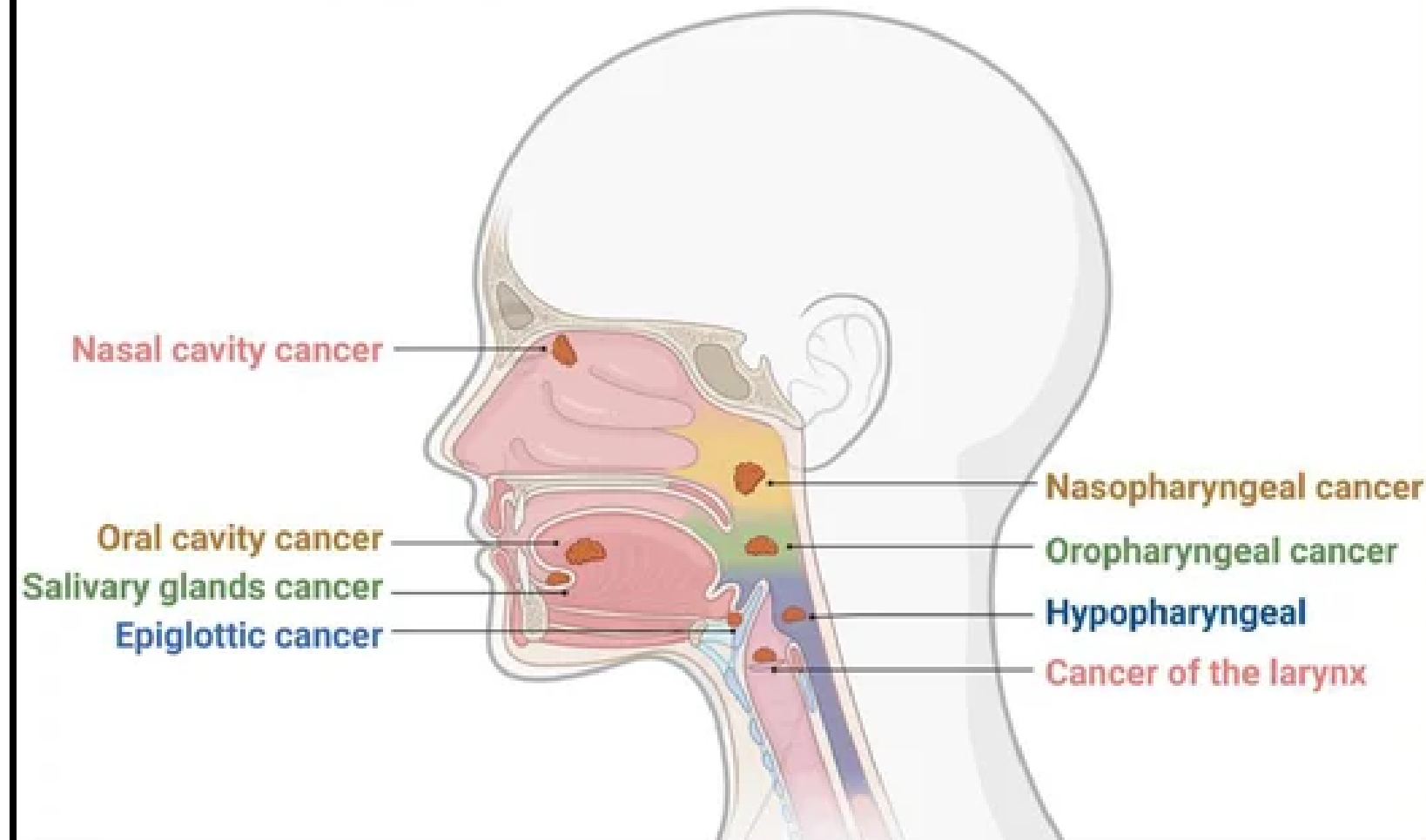


Estimated number of deaths 2026



Head and Neck Cancers (HNCs)

- a diverse group of tumors affecting the upper aerodigestive tract
- the 7th most common type of cancer worldwide
- the most common subtype is head and neck squamous cell carcinoma (HNSCC)



HNC types based on the anatomical location

946,456

- | | | |
|---------------------------|----------------------|----------------------|
| • salivary glands 5.81% | annual HNC new cases | • hypopharynx 9.16% |
| • larynx 19.97% | | • oropharynx 11.23% |
| • lip, oral cavity 41.16% | | • nasopharynx 12.72% |

Major risk factors

Viral and infectious:

- Human papillomavirus (HPV)
- Epstein-Barr virus (EBV)
- Chronic infections, e.g., chronic periodontitis



Lifestyle:

- Tobacco use
- Alcohol consumption
- Cannabis smoking



Genetic-related:

- Genetic predispositions – family history; mutations, e.g., *TP53*
- Immunosuppression

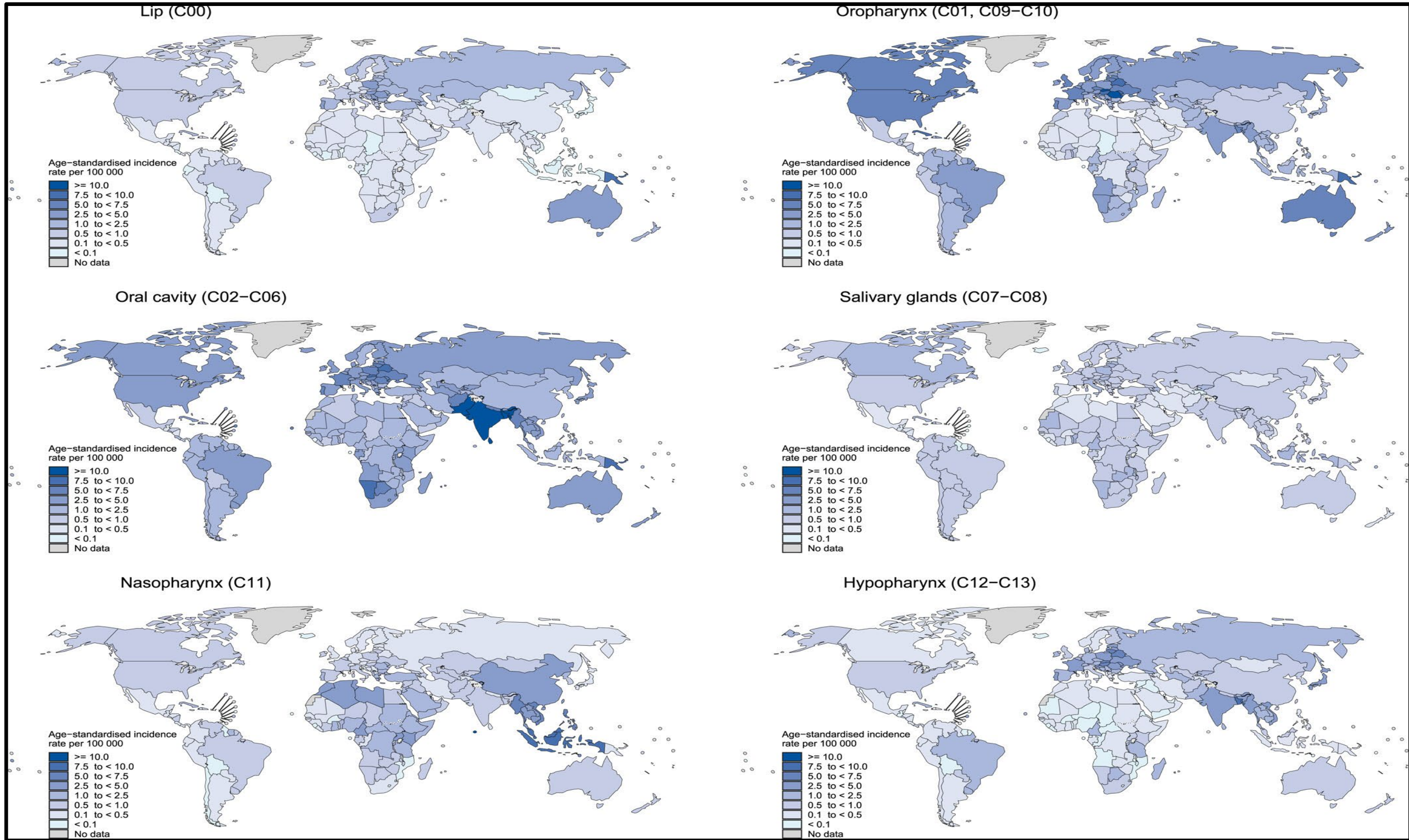


Environmental:

- Exposure to carcinogens
- Exposure to radiation



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2026 Vital Statistics



An estimated **60,480** Americans will be diagnosed with oral cavity or oropharyngeal cancer this year.



Approximately **165** people are newly diagnosed every day, that is roughly one person every **9** minutes.



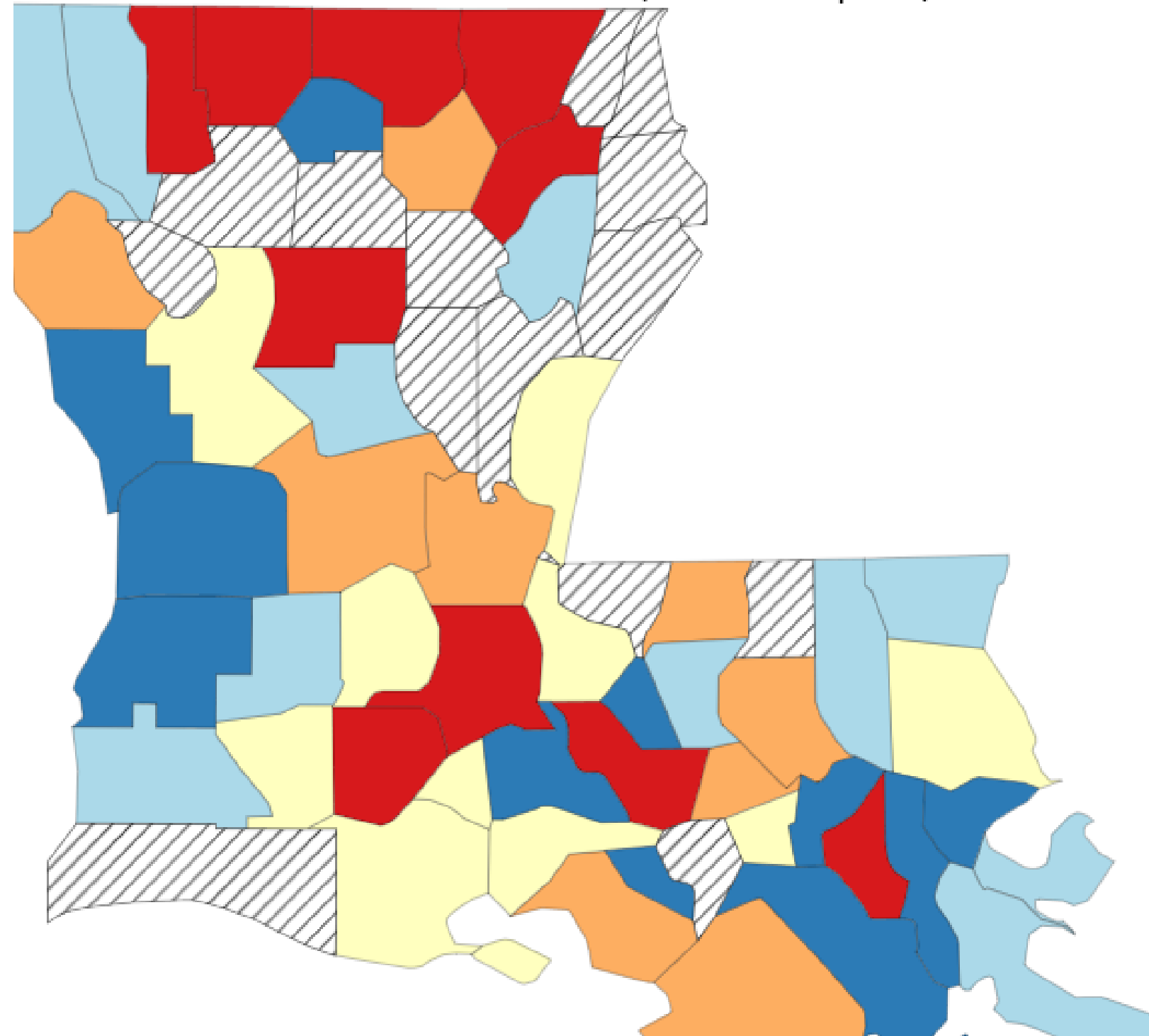
About **13,150** deaths are expected in 2026, averaging one death every single hour.

By 2026, high-risk **HPV16** has become the primary cause of oropharyngeal cancers, accounting for **70% to 80%** of cases involving the tonsils and tongue base. This shift marks the disease as a modern epidemic, having surpassed cervical cancer as the most common HPV-related malignancy in the United States, with incidence **rising 2% annually**, particularly among younger men.

Incidence Rates for Louisiana by Parish

Oral Cavity & Pharynx (All Stages^), 2018-2022

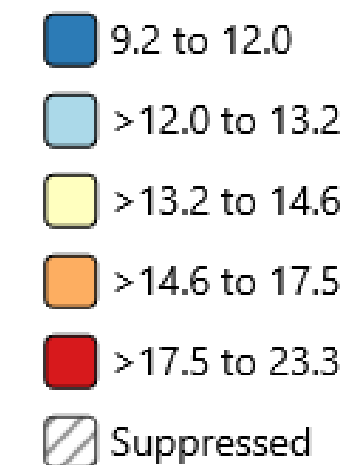
All Races (includes Hispanic), Both Sexes, All Ages



Mean annual incidence rate USA is 12.1

Mean annual incidence rate LA is 13.5

Age-Adjusted
Annual Incidence Rate
(Cases per 100,000)



Causes and Risk Factors:



Tobacco use
(smoking or
chewing)



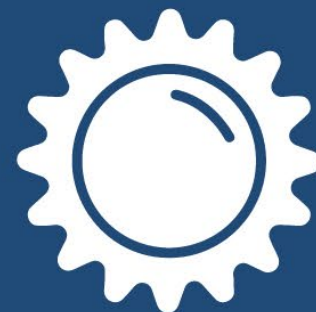
Excessive alcohol
consumptions



Human
papillomavirus
(HPV) infection



Poor oral
hygiene



Long-term sun
exposure (for lip
cancer)



Family history
of cancer



Exposure to
certain workplace
chemicals

Why Early Detection Matters?



A sore or ulcer in the mouth that doesn't heal



Persistent sore throat or hoarseness



Difficulty swallowing or breathing



Lump in the neck or jaw area



Unexplained weight loss



Constant ear pain without infection

Current HNC Therapies

Traditional therapies

Surgery

- Primary treatment effective for localized tumors, especially early stage;
- Combined with radio- and chemotherapy for more advanced stages;
- Salvage surgery, if primary treatment fails.



Radiotherapy

- Primary treatment (e.g., IMRT, proton therapy) along with surgery;
- May cause secondary malignancies due to radiation toxicity.



Chemotherapy

- Systemic treatment (e.g., cisplatin, 5-FU, paclitaxel) for advanced cases;
- Causes severe side effects;
- Problems related to drug resistance.



Molecular therapies

Targeted therapy

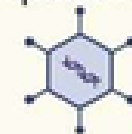
- Drugs targeting specific molecular pathways (e.g., cetuximab – EGFR, bevacizumab – VEGF).

Emerging targeted therapies

- Antibody-drug conjugates (ADCs), (e.g., trastuzumab – HER2, enfortumab – Nectin-4, sacituzumab – Trop-2).

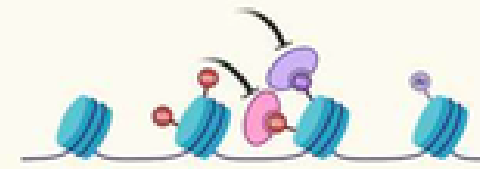
Gene therapy

- Oncolytic virus therapy using genetically modified viruses, e.g., adenoviruses;
- *TP53* gene therapy (e.g., advexin);
- CRISPR/Cas9 for HPV-positive HNC.



Epigenetic modulators

- DNMT inhibitors (e.g., decitabine);
- HDAC inhibitors.



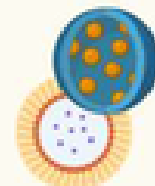
Immunotherapy

- Checkpoint inhibitors (FDA approved and clinical trials): Anti-PD-1/PD-L1 therapies (e.g., first-line treatment for R/M-HNC, PD-L1-positive).
- Adoptive cell therapies (e.g., tumor-infiltrating lymphocytes, CAR-T cell therapy).

Other approaches

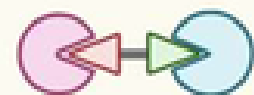
Nanomedicine-based

- Nanoparticles targeted delivery, especially cisplatin and paclitaxel in early phase clinical trials.



PROTAC-based

- Still in preclinical studies but emerging in targeting oncogenic proteins (e.g., targeting STAT3, enhancing radiotherapy via BRD4 degradation).



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Table 1
Complications associated with oral cancer therapies

Affected Structures	Potential Outcomes of Chemotherapy, Radiotherapy, and Surgery
Skin	Radiation dermatitis
Oral mucosa	Mucositis Infections: fungal, viral, bacterial
Teeth	Caries caused by hyposalivation
Jaws/bone	Chemotoxicity Osteoradionecrosis Secondary infections Mastication difficulties
Salivary glands	Hyposalivation/xerostomia
Muscles and soft tissues	Fibrosis Mastication Dysphagia Speech difficulties
Temporomandibular joint	Fibrosis and trismus
Tongue and taste buds	Taste dysfunction
Others	Pain Dentofacial abnormalities Altered quality of life

Modified from Turner L, Mupparapu M, Akintoye SO. Review of the complications associated with treatment of oropharyngeal cancer: a guide for the dental practitioner. Quintessence Int 2013;44(3):267–79.



Fig. 1. Mucositis after radiation therapy. Oral mucositis in a young male patient with nasopharyngeal rhabdomyosarcoma after radiotherapy.



Fig. 1. Chemotherapy-induced mucositis of the right buccal mucosa. (Courtesy of Nathaniel S. Treister, DMD, DMSc, Boston, MA.)



Fig. 4. Trismus. Maximum interincisal mouth opening was limited to 9 mm in this female patient who received radiotherapy to the head and neck.

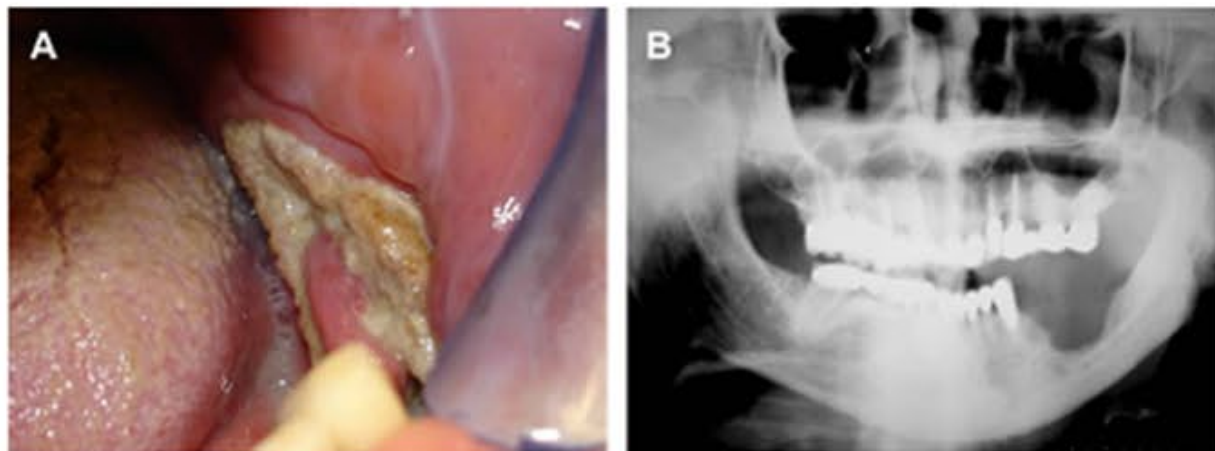


Fig. 4. (A) Post-radiation osteonecrosis of the left mandible. (B) Panoramic radiograph showing postradiation osteonecrosis of the left mandible.



Fig. 3. Radiation-induced caries. (Courtesy of Nathaniel S. Treister, DMD, DMSc, Boston, MA.)

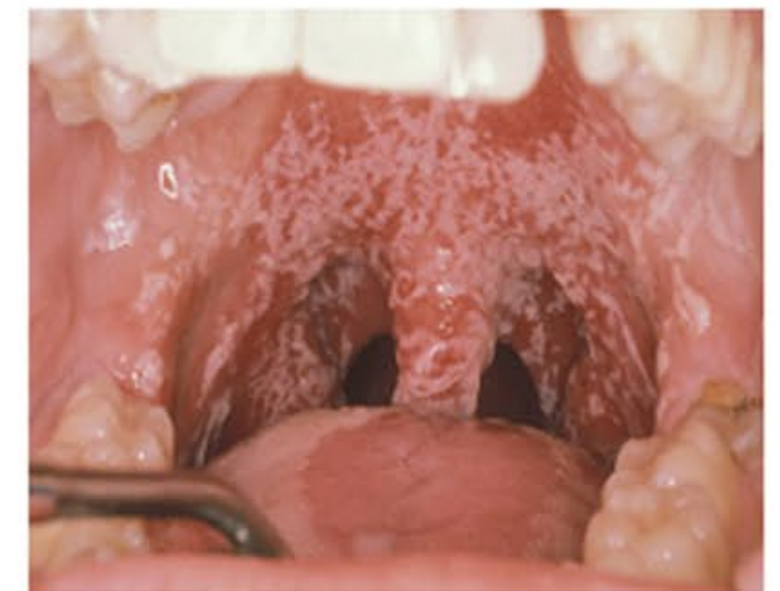


Fig. 2. Oropharyngeal pseudomembraneous candidiasis.



Fig. 3. Oral dryness. Radiotherapy-induced dry mouth is associated with depapillation of tongue dorsum and hairy tongue.



Figure 2 Oral HSV. (a) Clustered vesicles and crusted ulcers on vermilion border and peri-oral skin, (b) Sharply demarcated ulcer on the hard palate, (c) Coalescing shallow, round ulcers with scalloped borders on the hard palate

Dental Management strategies for the general dental practitioner - National Cancer Institute (NCI) at the National Institutes of Health

Tooth brushing + Dentifrice

- Use of soft nylon-bristled toothbrushes with two or three rows
- Use of electric + ultrasonic toothbrushes are also acceptable if the patients can use them without causing trauma to the oral mucosa
- Any fluoride containing dentifrice can be used by most patients that received radiotherapy
- Non-mint flavored dentifrices are better tolerated than the mint-flavored dentifrices

Continued

Mouth rinsing + Flossing

- Post mucositis dental management should include frequent mouth rinses with 0.9% saline, sodium bicarbonate solution or a combination of both solutions

Fluoride supplementation

- Use of a 1.1% neutral sodium fluoride gel or a 0.4% stannous fluoride gel applied at least once/day

Topical antimicrobial rinses

- Either 0.12 – 0.2% Chlorhexidine or providence iodine oral rinse for management of acute gingival lesions for 1 to 2 minutes before expectoration
- Repeat up to four times a day depending on severity of the gingival + periodontal inflammation

Continued

Care of dentures during + after radiation therapy

- Wearing dentures should be discontinued during radiotherapy + for a few weeks after completion of radiotherapy to promote healing of radiation mucositis
- The patient should be instructed to wear the dentures only when eating + discontinue their use at other times
- When the dentures are not being used, they should be soaked in antimicrobial solutions
- If necessary, a denture can be used a carrier to keep medications such as antifungals needed for oral care in close contact with the oral mucosa

Continued

Care of lips + mouth

- Preventing lip dryness will reduce risks of tissue injury
- Lanolin-based creams + ointments may be effective in moisturizing + lubricating the lips + thereby protect the lips from trauma
- Dental caries secondary to hyposalivation is a complication of radiation therapy
□ appropriate instructions to prevent the radiation caries along with methods to increase salivation is warranted (hydration, sialogogues etc.)



Questions?



THANK YOU

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