

Oropharyngeal Cancer Burden: Disparities by Gender and Region in 2022



Alan Truong¹, Lisa Bienstock², Shreekrishna Akilesh³

¹PGY-2 Resident, ²Associate Director, ³Senior Associate Director
¹⁻³NYU Langone Hospitals-Advanced Education in Pediatric Dentistry, Phoenix, AZ, USA

NYU Langone Dental Postdoctoral
 Residency Programs

INTRODUCTION

- Oropharyngeal cancer (OPC) has emerged as one of the most rapidly increasing head and neck malignancies in recent decades. OPC, which includes malignancies of the tonsils, base of tongue, soft palate, and pharyngeal walls, represents one of the most dynamic shifts in current cancer epidemiological trends.
- Once dominated by tobacco- and alcohol-driven cases, OPC has become increasingly shaped by HPV-associated oropharyngeal squamous cell carcinoma, particularly in high-income countries, with HPV16 as the predominant genotype.^[7,8]
- In some settings, the incidence of HPV-positive OPC among men in higher-income countries has already surpassed cervical cancer as the most common HPV-associated malignancy^[1,7,10].
- As of 2022, HPV prevalence, persistent tobacco and alcohol consumption, and inequalities in healthcare access have contributed to complex global patterns of incidence, prevalence, and mortality.

PURPOSE

- This study focused on understanding the impact and global patterns of oropharyngeal cancer by examining incidence, mortality, and prevalence when comparing regions and gender using GLOBOCAN 2022 data.
- Understanding differences across regions and gender is important for creating targeted prevention strategies, resource allocation, and improving global health equity.

METHOD

- This study extracted publicly available data from the GLOBOCAN 2022 database, developed by the International Agency for Research on Cancer in collaboration with the World Health Organization.
- Data for oropharyngeal cancer (ICD-10 code C10) were extracted for the year 2022 and stratified by gender across six regions: Africa, Asia, Europe, North America, Oceania, Latin America and the Caribbean(LAC).
- Absolute case counts for incidence, mortality, and five-year prevalence were summarized to characterize regional disparities and gender differences.
- Mortality-to-incidence ratios were calculated by dividing mortality by incidence cases for each region as an indicator of prognosis and survival outcomes.

FIGURES

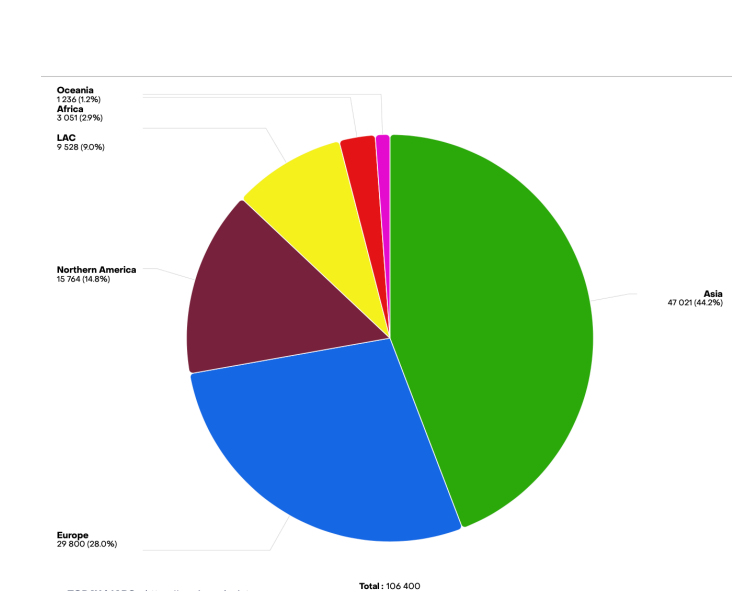


Figure 1-Absolute Numbers, Incidence of Oropharyngeal Cancer, Both sexes in 2022 (Taken from GLOBOCAN 2022 Version 1.1-08.02.2024)

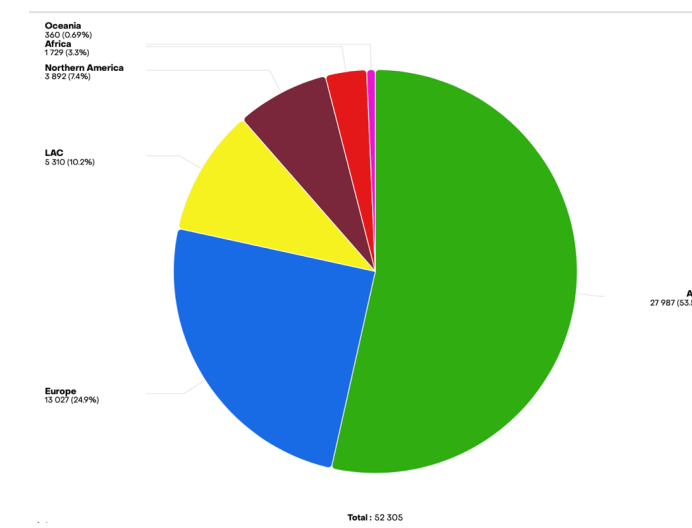


Figure 2-Absolute Numbers, Mortality of Oropharyngeal Cancer, Both sexes in 2022 (Taken from GLOBOCAN 2022 Version 1.1-08.02.2024)

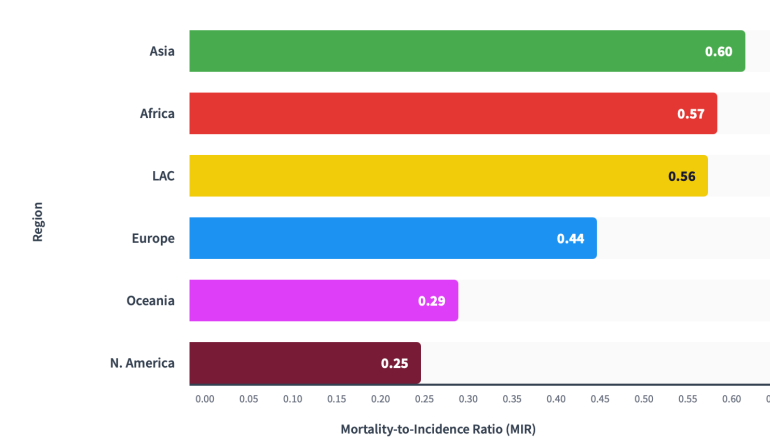


Figure 3- Mortality-to Incidence Ratio of Oropharyngeal Cancer by Region, 2022 (calculated from GLOBOCAN 2022 data)

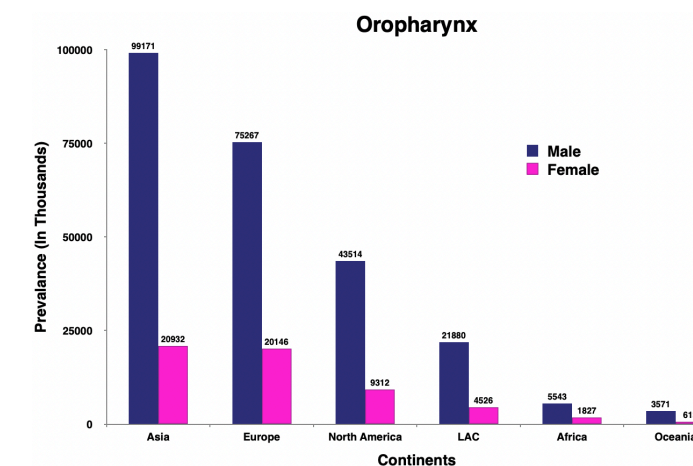


Figure 4-Absolute Numbers, 5-Year Prevalence of Oropharyngeal Cancer, Both sexes in 2022 (Graph Reproduced from the data taken from GLOBOCAN 2022)

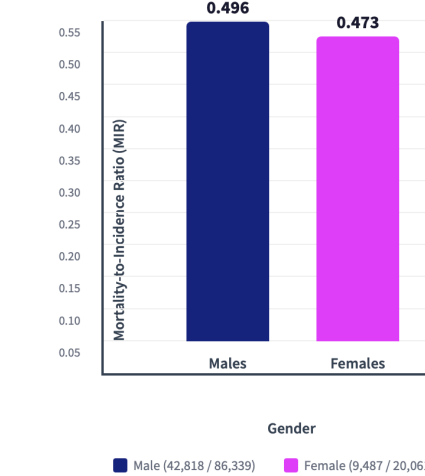


Figure 5- Mortality-to Incidence Ratio of Oropharyngeal Cancer by Gender, 2022 (calculated from GLOBOCAN 2022 data)

RESULTS

- According to GLOBOCAN 2022 estimates, there were 106,400 new oropharyngeal cancer cases and 52,305 deaths worldwide.
- Asia carried the heaviest burden with 47,021 incident cases (44.2% of global incidence) and 27,987 deaths (53.5% of global mortality).
- Mortality-to-incidence ratios revealed differences in survival outcomes, with Asia demonstrating a ratio of 0.59 compared to 0.25 in North America and 0.29 in Oceania. Ratios were similarly elevated in Africa (0.57) and LAC (0.56). Across all regions, men carried a consistently higher burden than women.
- Global MIR was comparable between genders (male: 0.50; female: 0.47), suggesting that disparity reflects differential risk factor exposure rather than survival differences.
- Male-to-female prevalence ratios ranged from 3:1 in Africa to nearly 6:1 in Oceania, with Asia, Europe, and North America exhibiting a ratio around 4.7:1.
- These findings show significant gender and geographic disparities in oropharyngeal cancer burden and outcomes.

CONCLUSIONS

- These findings highlight how oropharyngeal cancer burden and survival vary greatly across regions and gender, with Asia displaying more than half the global mortality, despite accounting for less than half of the cases, and men having 3-6 times higher prevalence than women.
- While men bear 3 to 6 times higher prevalence, similar MIR between genders suggests this gap reflects risk factor exposure rather than prognosis.
- These disparities are consistent with HPV epidemiology, tobacco and alcohol exposure, and access to early diagnosis and treatment. Closing these gaps will require expanding gender-neutral HPV vaccination, strengthening tobacco and alcohol prevention, and ensuring equal access to care, particularly in low- and middle-income countries.
- Utilizing targeted interventions where the burden is greatest could prevent thousands of oropharyngeal cancer deaths each

REFERENCES

- Lechner M, Liu J, Masterson L, Fenton TR. HPV-associated oropharyngeal cancer: epidemiology, molecular biology and clinical management. *Nat Rev Clin Oncol*. 2022 May;19(5):306-327. doi: 10.1038/s41571-022-00603-7. Epub 2022 Feb 1. PMID: 35105976; PMCID: PMC8851440.
- Lee Y-C, A. & Hashibe M. (2014). Tobacco, Alcohol, and Cancer in Low and High Income Countries. *Annals of Global Health*, 80(5), 378-383. <https://doi.org/10.1016/j.aogh.2014.09.010>
- Hashim, D., Genden, E., Posner, M., Hashibe, M., & Boffetta, P. (2019). Head and neck cancer prevention: from primary prevention to impact of clinicians on reducing burden. *Annals of Oncology*, 30(5), 744-756. <https://doi.org/10.1093/annonc/mdz084>
- Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R. L., Torre, L. A., Jemal, A. (2024). Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 74(3), 229-263. <https://doi.org/10.3322/caac.21834>
- Ferlay, J., Ervik, M., Lam, F., Colombet, M., Mery, L., Piñeros, M., Bray, F. (2024). *Global cancer observatory: Cancer today*. Lyon, France: International Agency for Research on Cancer. Retrieved from <https://gco.iarc.fr/today>
- International Agency for Research on Cancer (IARC). (2022). *Oropharynx fact sheet, GLOBOCAN 2022*. Lyon, France: World Health Organization. Retrieved from <https://gco.iarc.int/media/globocan/factsheets/cancers/3-oropharynx-fact-sheet.pdf>
- Gillison, M. L., Alemany, L., Snijders, P. J., Chaturvedi, A., Steinberg, B. M., Schwartz, S., de Sanjosé, S. (2021). Human papillomavirus and diseases of the upper airway: Head and neck cancer and respiratory papillomatosis. *Vaccine*, 39(30), 4308-4321. <https://doi.org/10.1016/j.vaccine.2020.05.093>
- Gupta, B., Johnson, N. W., & Kumar, N. (2020). Global epidemiology of head and neck cancers: A continuing challenge. *Oncology*, 91(1), 13-23. <https://doi.org/10.1159/000505360>
- Lai, Y.-H., Su, C.-C., Wu, S.-Y., Hsueh, W.-T., Wu, Y.-H., Chen, H. H. W., Hsiao, J.-R., Liu, C.-H., & Tsai, Y.-S. (2022). Impact of Alcohol and Smoking on Outcomes of HPV-Related Oropharyngeal Cancer. *Journal of Clinical Medicine*, 11(21), 6510. <https://doi.org/10.3390/jcm11216510>
- Roman BR, Aragonés A. Epidemiology and incidence of HPV-related cancers of the head and neck. *J Surg Oncol*. 2021 Nov;124(6):920-922. doi: 10.1002/jso.26687. Epub 2021 Sep 23. PMID: 34558067; PMCID: PMC8522291.
- Gornley, M., Creaney, G., Schache, A., Ingarfield, K., & Conway, D. I. (2022). Reviewing the epidemiology of head and neck cancer: definitions, trends and risk factors: Reviewing the epidemiology of head and neck cancer: definitions, trends and risk factors. *British Dental Journal*, 233(9), 780-786. <https://doi.org/10.1038/s41415-022-5166-x>
- Zumsteg, Z. S., Luo, M., Rosenberg, P. S., Etrod, J. K., Bray, F., Vaccarella, S., Chaturvedi, A. K. (2023). Global epidemiologic patterns of oropharyngeal cancer incidence trends. *JNCI: Journal of the National Cancer Institute*, 115(12), 1544-1554. <https://doi.org/10.1093/jnci/djad169>
- Fonseca, T. C., Jural, L. A., Marañón-Vásquez, G. A., Magno, M. B., Roza, A. L. O. C., Ferreira, D. M. T. P., Maia, L. C., Romalbach, M. J., Agostini, M., & Abrahão, A. C. (2023). Global prevalence of human papillomavirus-related oral and oropharyngeal squamous cell carcinomas: a systematic review and meta-analysis. *Clinical Oral Investigations*, 28(1), Article 62. <https://doi.org/10.1007/s00784-023-05425-0>
- Megwalu, U. C. (2017). Impact of County-Level Socioeconomic Status on Oropharyngeal Cancer Survival in the United States. *Otolaryngology-Head and Neck Surgery*, 156(4), 665-670. <https://doi.org/10.1177/014959817691462>
- Pereira, L. M. E., Antunes, J. L. F., & Peres, M. A. (2021). Mortality from oral and oropharyngeal cancer: age-period-cohort effect, Brazil, 1983-2017. *Revista de Saúde Pública*, 55, 72. <https://doi.org/10.11606/s1518-8787.202105003093>