



Time to act: a global call for oral cancer prevention and early detection



Dan Dunkley/Science Photo Library

Oral cancer, ranked among the 16th most common cancers globally, represents a major public health burden.¹ In some countries in south Asia, oral cancer is the most frequent cancer among men. A recent systematic analysis for the Global Burden of Disease study concluded that insufficient action in the past three decades has led to little change in population oral health, underscoring the necessity for renewed strategic focus.²

Despite advances in treatment, the global 5-year overall survival rate for oral cancer remains low at 50–60%.¹ This poor prognosis is largely attributed to late-stage diagnoses.¹ Conversely, detection at an early stage of disease can improve 5-year survival rates to around 80%.¹ These results underscore the important need for renewed and implementable strategies to identify potentially malignant conditions and for early access for care. We propose accelerated global mobilisation around three foundational strategies emphasising prevention and early detection, essential for overcoming delays in accessing care. Such action could lead to improved survival, lower morbidity following treatment, and lower health-care costs.

First, there should be prompt referral upon identification of oral potentially malignant disorders (OPMDs) for which timely intervention is paramount. Initial malignant lesions can present as non-healing ulcers or red and white mucosal patches (ie, OPMDs) that should trigger immediate concern.³ We advocate early detection and diagnosis with prompt referral for expert evaluation, including biopsy for histopathological diagnosis, for any suspicious oral mucosal lesion persisting longer than 2 weeks.^{4,5} Primary care providers, particularly dentists, are crucial as first-line examiners. However, educational requirements for clinical oral examination lack universality across health professions, and diagnostic expertise varies substantially outside specialist settings.⁴ Standardised competency-based training is imperative to ensure primary health-care providers possess the requisite skills for accurate clinical oral examination.^{4,5} Dedicated training is essential to overcome the documented high variability in diagnostic expertise outside of specialist settings.^{4,5} The feasibility of training non-specialised health-care workers to perform clinical oral examination and screening has

been reported, emphasising that expanding capability is achievable.³ Furthermore, education in advances in the management of OPMDs is essential.⁶

Second, mobile technology and artificial intelligence (AI) should be used for digital application. While clinical oral examination remains the principal screening method, its implementation suffers from heterogeneous sensitivity across settings.³ Mobile technologies offer implementable solutions—particularly in low-resource environments—by integrating rapid referral pathways with validated digital tools.⁷ Teledentistry using platforms, such as smartphone-based applications has shown feasibility. Remote assessment of lesions using mobile applications (eg, MeMoSA) showed a high referral accuracy, with a sensitivity of 94.0% and a specificity of 95.5%, for identifying lesions requiring specialist review.⁸ AI could represent the next frontier. Deep-learning models integrated with point-of-care devices show promise for screening and monitoring of OPMDs in resource-limited settings.⁷ However, realising AI's potential to reduce health inequities requires rigorous standardisation and large-scale validation.⁹

Last, the primary prevention and management of OPMDs should be prioritised. Any successful global call for action should prioritise prevention through the control of established risk factors. Oral cancer shares risk factors common to non-communicable diseases that are primarily caused by a combination of genetic, environmental, and life style factors, including all forms of tobacco use, harmful alcohol use, and areca nut consumption. A systematic analysis estimated that 30.8% of oral cancer cases worldwide were attributable to smokeless tobacco or areca nut consumption.¹⁰ Given this substantial burden, particularly in low-income and middle-income countries, cessation has to be prioritised. Evidence-based primary prevention strategies are outlined in the Oral Cancer Prevention Handbook by the International Agency for Research on Cancer.¹ Behavioural intervention among adults proved effective in reducing oral cancer and OPMD risk.¹ Tobacco smoking cessation shows progressive risk reduction, potentially reaching the levels of those who have never smoked after 20 years. Similarly, areca nut cessation reduces oral cancer and

OPMD risk.¹ Management of OPMDs would contribute to reducing oral cancer development among individuals at high risk.⁶

Prevention should incorporate emerging factors and prophylactic measures.¹ Although empirical evidence showing reduced oral cancer incidence is unavailable due to long latency periods, strong scientific rationale supports that prophylactic human papillomavirus (HPV) vaccination would reduce future HPV-associated oral cancer incidence, depending on population vaccination coverage.¹

The global cancer community needs to integrate these proven primary prevention strategies with rapid, technology-supported early detection to impact the global stagnation in oral cancer control. Ultimately, overcoming persistent lack of progress requires the seamless integration of behavioural primary prevention with AI-enhanced digital platforms, ensuring widespread diagnostic expertise and the accelerated implementation of rapid referral pathways.^{1,3,10} Combating the persistent global oral cancer burden demands a multi-approach strategy: supporting early detection and referral with competent, well trained professionals, facilitated by high-accuracy digital triage platforms, while simultaneously prioritising preventive management policies. We urge ministries of health worldwide to develop country-specific, evidence-based clinical practice guidelines to control oral cancer.

DM received a grant from the French National Research Agency under the France 2030 programme (reference number ANR-22-CMAS-0013). All other authors declare no competing interests.

**Delphine Maret, Saman Warnakulasuriya, Joel B Epstein, Thomas Geeraerts, Emmanuelle Vigarios
comtesse.delphine@iuct-oncopole.fr*

Department of Dental Surgery (DM), Department of Anesthesiology and Critical Care (TG), and Department of Supportive Care (EV), Université de Toulouse (DM, TG, EV), Centre Hospitalier Universitaire, Institut Universitaire du cancer Toulouse-Oncopole (DM, EV), Oncopole Claudius Regaud (EV) Laboratoire CAGT (EV), Laboratoire CAGT (DM), Toulouse 31400, France; WHO Collaborating Centre for Oral Cancer and Faculty of Dentistry, Oral and Craniofacial Sciences, King's College London, London, UK (SW); City of Hope Comprehensive Cancer Center, Duarte, CA, USA (JBE); Cedars-Sinai Health System, Los Angeles, CA, USA (JBE)

- 1 International Agency for Research on Cancer. Oral cancer prevention volume 19. International Agency for Research on Cancer, 2023.
- 2 GBD 2021 Oral Disorders Collaborators. Trends in the global, regional, and national burden of oral conditions from 1990 to 2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet* 2025; **405**: 897–910.
- 3 Warnakulasuriya S, Kerr AR. Oral cancer screening: past, present, and future. *J Dent Res* 2021; **100**: 1313–20.
- 4 Coppola N, Mignogna MD, Rivieccio I, et al. Current knowledge, attitudes, and practice among health care providers in OSCC awareness: systematic review and meta-analysis. *Int J Environ Res Public Health* 2021; **18**: 4506.
- 5 Lingen MW, Tampi MP, Urquhart O, et al. Adjuncts for the evaluation of potentially malignant disorders in the oral cavity: diagnostic test accuracy systematic review and meta-analysis—a report of the American Dental Association. *J Am Dent Assoc* 2017; **148**: 797–813.e52.
- 6 Gates JC, Abouyared M, Shnayder Y, et al. Clinical management update of oral leukoplakia: a review from the American Head and Neck Society Cancer Prevention Service. *Head Neck* 2025; **47**: 733–41.
- 7 Birur NP, Song B, Sunny SP, et al. Field validation of deep learning based point-of-care device for early detection of oral malignant and potentially malignant disorders. *Sci Rep* 2022; **12**: 14283.
- 8 Haron N, Rajendran S, Kallarakkal TG, et al. High referral accuracy for oral cancers and oral potentially malignant disorders using telemedicine. *Oral Dis* 2023; **29**: 380–89.
- 9 Vinay V, Jodalli P, Chavan MS, et al. Artificial intelligence in oral cancer: a comprehensive scoping review of diagnostic and prognostic applications. *Diagnostics* 2025; **15**: 280.
- 10 Rungay H, Nathan ST, Shah R, et al. Global burden of oral cancer in 2022 attributable to smokeless tobacco and areca nut consumption: a population attributable fraction analysis. *Lancet Oncol* 2024; **25**: 1413–23.

Greater transparency for oncology clinical trials reporting



Over recent decades, advances in cancer treatment have yielded substantial improvements in patient outcomes, driving up survival, and even rendering some cancers curable. These advances have been achieved not only by remarkable scientific breakthroughs, but also by unprecedented financial investment in research and development, including the conduct of clinical trials of a size and complexity only feasible by the involvement of the commercial sector, predominantly, the pharmaceutical industry. However, therein lies a tension: the need to explore scientific truths versus a financial return on investment. The balance between these two ambitions varies between stakeholders.

Academically run studies tend towards advances in scientific understanding and patient-centred outcomes, while commercially funded studies are designed to not only improve patient outcomes, but also to develop a marketable product to deliver revenue and profits on investment. These commercial objectives have driven an increase in the use of surrogate endpoints that can yield earlier results and quicker regulatory approval. But many surrogate endpoints are unproven. Furthermore, pressures to report positive results have seen an increase in the use of overly favourable, subjective language in many scientific journals. Many academics are now questioning whether the equilibrium between these