Letter to the editor in reference to: "A web-based prediction score for head and neck cancer referrals"

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Sir,

We read with interest the article by Lau et al (2018) on the design of a web-based prediction score for head and neck cancer (HNC) referrals. The authors state that there are no similar scoring systems available in the literature that are web-based and applicable to the two-week-wait referrals.

Over the last years, risk calculators for common cancer have been extensively explored and are available online, aiming to improve cancer referral pathways and detection.[1, 2] A HNC risk calculator (HNC-RC) based on symptoms and demographics has also been developed and is available online (Sensitivity: 74.8%; specificity: 65.9%; and overall predictive power (AUC): 0.77).[3] It has also been externally validated maintaining its discriminatory ability (sensitivity: 79.3%; specificity: 68.6%; and AUC: 0.81).[4]

In their abstract, Lau et al have stated that logistic regression and artificial network machine approached have been used. Despite this, only the former was employed, as mentioned in their methodology section, due to time-related restrictions and effort required to ensure an error-free algorithm.

Focusing on the threshold used to triage the referrals, they have accepted a sensitivity of 31% as this yielded statistically the best discriminatory combination using the F-statistics (92% specificity, AUC: 0.79). Clinically, this translates in two out of three patients with cancer being misdiagnosed. Their false-negative figures were indeed very high in the external validation cohort. We strongly encourage the probability to be re-assessed in favour of the sensitivity. This could mean that the statistical performance of the model is suboptimal but will result in a clinically more useful tool. A recent systematic review on the efficacy of the 2-week-wait HNC clinics in the UK showed a pooled sensitivity of 40.8%.[5] Proposing a scoring tool that gives a lower sensitivity than the current standard is not encouraged.

Finally, the Lau et al model did not include significant red flags such as dysphagia, odynophagia and oral swellings. The ear and facial lesions could have potential been grouped together and the thyroid swelling included within the neck lump variable, making it easier to use by GPs and reducing the complexity of the model. Unilateral hearing loss was one of the statistically significant risk factors in their model. It would be interesting to know how many cancers presented with this symptom and its positive predictive value, which has been found to be very low in previous studies.[3, 4]

References:

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4. Tikka T, Paleri P, MacKenzie K. External validation of a cancer risk prediction model for suspected head and neck cancer referrals. *Clinical Otolaryngol*. 2018; 43(2): 714- 717.
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