Limitations of simulation models for cervical cancer screening

We read with great interest the Article by Talía Malagón and colleagues.[1] The authors highlight the continued reliance on simulation modelling to inform decisions to stop cervical screening, and expand on previous work[2] by explicitly modelling the effect of more sensitive human papillomavirus (HPV) testing and hysterectomy.[3] They conclude that although their model predicts an incremental increase in cervical cancer incidence when younger women exit screening, "there is little benefit in screening women with a negative [HPV] test after age 55 years", on the basis of the low, model-predicted absolute risk of cervical cancer.

We believe it is important to acknowledge the potential impact of some key limitations to these simulations because they relate to the generalisability of the results. The transition probabilities guiding lifetime risk prediction are estimated (ie, not observed) from calibration to age-specific Canadian surveillance data. The validity of translating these results to other populations is thus dependent on the extent to which the calibration targets reflect an unbiased (and thus broadly valid) natural history of HPV and cervical cancer, as well as the same sensitivity of screening and diagnostic tests, and pre-cancer treatment outcomes. Cohort and period effects of screening, hysterectomy, and sexual behaviour vary substantially by population. For example, hysterectomy-corrected, age-specific incidence is very different in black and white women in the USA,[3] such that the data presented in this study might not apply to black women. Although it is not possible to model every factor, we emphasise that caution is required when interpreting the effect that each of these issues could have on cancer risk, and changing clinical practice on the basis of these results. For example, when considering increased postmenopausal HPV prevalence in a sensitivity analysis, the authors show a nearly doubled increase in lifetime cervical cancer risk after a negative HPV test result at age 55 years (0·09% *vs* 0·05%). Given that this is more than 3–5 times higher than the risks cited by the authors as a potential threshold for risk tolerance (0·017–0·025%), we question their conclusion that the cohort effects portended by the sexual revolution of the 1960s and 1970s would not meaningfully change their results.[4] In summary, although we applaud the efforts made by the authors to systematically address the inherent limitations of simulation modeling, we urge decision makers to be cautious in applying the conclusions to broader population contexts.[5]

We declare no competing interests.

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