Cancer elimination thresholds: one size does not fit all

Authors' reply

In our analysis of the timeline for cervical cancer elimination as a public health issue in Australia,[1] we considered two potential thresholds. These thresholds were the rare cancer threshold (often considered as six cases per 100 000 women in Europe and Australia), and a lower threshold of four cases per 100 000 women. We concluded that Australia is on track to reduce cervical cancer below four cases per 100 000 before 2035. In their Correspondence, Alejandra Castanon and colleagues posit that an elimination threshold of four per 100 000 "is too easy for some countries and impossible for others". As we made clear in our study, the process of defining an appropriate threshold for the elimination of cervical cancer as a public health problem is still underway and we agree that defining a threshold that is appropriate for global use and advocacy is indeed challenging. We suggest that if a threshold is defined as a number of incident cases per 100 000 women per year, it should be conceived as a target for achievement by active intervention, for example, deployment of the two proven prevention strategies (prophylactic HPV vaccination and cervical screening) to prevent cancer cases that would otherwise occur in that population.

Achievability of an elimination target for cervical cancer incidence, and the subsequent cumulative impact on lives saved, depends not only on the threshold for elimination, but also on the timeframe considered. Castanon and colleagues present projections for England until the year 2040. We welcome projections for other countries, but suggest that modelling of longer timeframes, potentially to the end of the century (as we did for Australia), will be required for many countries to capture the full impact of vaccination and cervical screening.

The 2018 WHO call to action for cervical cancer elimination aims to galvanise international action to drive scale-up of both HPV vaccination and cervical screening in low-income and middle-income countries.[2] Rates of cervical cancer vary widely between countries, with the highest proportion of cases observed in some of the lowest income countries.[3] It is important to note that, for low-income countries with a high burden of cervical cancer and no existing screening programme, screening even once or twice per lifetime is expected to reduce cervical cancer incidence and mortality more quickly compared to relying on vaccination alone. Even in well-resourced settings, implementing more effective strategies for both vaccination and HPV screening can reduce cancer rates even more rapidly.[4,5] Going forward, modelling will continue to have a crucial role in predicting the timing and impact of scale-up targets for vaccination and cervical screening at the global level.

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1 Hall MT, Simms KT, Lew JB, et al. The projected timeframe until cervical cancer elimination in Australia: a modelling study. *Lancet Public Health* 2019; **4:** e19–27.

2 WHO. WHO leads the way towards the elimination of cervical cancer as a public health concern. 2018. https://www.who.int/reproductivehealth/cervical-cancer-public-health-concern/en/ (accessed Nov 3, 2018).

3 Bray F, Ferlay J, Soerjomataram I, Siegal RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018; **68:** 394–424.

4 Castañon A, Rebolj M, Sasieni P. Is a delay in the introduction of human papillomavirus-based cervical screening affordable? *J Med Screen* 2018; published online Oct 3. DOI:10.1177/0969141318800355.

5 Hall MT, Simms KT, Lew J-B, Smith MA, Saville M, Canfell K. Projected future impact of HPV vaccination and primary HPV screening on cervical cancer rates from 2017–2035: Example from Australia. *PLoS One* 2018; published online Feb 14. DOI:10.1371/journal.pone.0185332.