

What will it take to eliminate cervical cancer in the USA?



Published Online
February 10, 2020
[https://doi.org/10.1016/S2468-2667\(20\)30028-1](https://doi.org/10.1016/S2468-2667(20)30028-1)
See [Articles](#) page e213

Cervical cancer, a preventable disease, is the fourth most common cancer worldwide, accounting for the death of more than 311 000 women in 2018.¹ Most of these women were living in low-income and middle-income countries where access to affordable, high-quality cancer health services, including those for cervical cancer prevention and control is profoundly limited. By contrast, in the USA, similar to other countries with robust cervical cancer prevention and control programmes, considerable declines in incidence and mortality of cervical cancer have been observed in the past few decades, with an age-standardised incidence of 6.5 cases per 100 000 women in 2018.¹

In *The Lancet Public Health*, Emily Burger and colleagues² present the first comparative analysis of two independently developed, previously validated models from the Cancer Intervention and Surveillance Modeling Network to project timelines for the elimination of cervical cancer in the USA. The authors present estimates for the achievement of the elimination target of four cases or fewer per 100 000 women-years³ under different assumptions. Under status quo assumptions, the authors projected that depending on the two models, elimination would either be achieved by 2038 or 2046, while scaling up of screening alone to 90% coverage would shorten the time to elimination by 10–13 years, averting a mean of 1400–2088 new cases annually between 2019 and 2100. By contrast, the authors predicted that increasing only vaccination coverage to 90% of girls would have a modest impact, shortening time to elimination by 1–3 years, and averting a mean of 95–716 new cases annually. When the model included increasing vaccination of both boys and girls (aligned with Centers for Disease Control and Prevention recommendations⁴), and other scenarios including vaccinating multi-age cohorts, only a marginal effect was observed compared with scaling up of coverage among girls only.

This analysis had numerous strengths, including the previously validated methods, well-described comparisons between the models, and use of published data on global estimates.⁵ The authors also projected elimination year using different populations for age standardisation and assuming varying rates of hysterectomies (for benign conditions). The authors did

not consider cost or cost-effectiveness in this analysis, and did not include changes to the status quo in terms of access to affordable treatment for invasive cancers including surgery, systemic treatment, and radiotherapy, which would have strengthened their analysis.

Burger and colleagues rightly note that it is the underscreened women and women who are never screened who are most at risk of death from cervical cancer. Despite progress in improving access to screening, treatment, and care for women with cervical cancer in the USA,⁶ marked disparities persist among women from racial and ethnic minority populations, women residing in rural and remote areas, and women who are otherwise socially or economically disadvantaged.^{7,8}

Beavis and colleagues' analysis,⁹ using the US 2000 standard population corrected for hysterectomy rates, identified substantially greater differences than previously reported, with cervical cancer mortality rates as high as 10.1 cases per 100 000 black women versus 4.7 cases per 100 000 white women. The ethnic disparity was particularly evident among older women when viewed as age-specific rates. Of particular relevance to the study by Burger and colleagues, Beavis and colleagues' 2017 analysis cited a number of contributory factors in addition to screening uptake, including different rates of complete surgical staging, and the use of (adjuvant or curative) radiotherapy.

As outlined by WHO, to achieve elimination by 2030, each country must achieve the following global targets: 90% coverage of human papillomavirus (HPV) vaccination of girls (by age 15 years); 70% coverage of screening (70% of women screened with high-performance tests by the ages of 35 and 45 years); 90% treatment of precancerous lesions; and management of 90% of invasive cancer cases.³ To achieve WHO recommended global targets in the USA, efforts will be required to address these multifactorial health disparities, which might only be partly addressed by HPV self-sampling, a single-dose vaccination regimen (if ultimately proven as effective), and other technical advances such as machine learning¹⁰ and artificial intelligence. Rigorous implementation research with community-engaged approaches are also needed, to improve vaccination and screening rates, and the

completion of the entire clinical care pathway among those at greatest risk.

Cervical cancer elimination is increasingly recognised as achievable. The tools, efficacy and cost-effectiveness data and now, arguably, the political will are available to enable elimination. For such aspirational goals to be realised in any country, health care must be considered a basic human right. Moreover, pragmatic multisectoral efforts will be required to rapidly increase access for all to cervical cancer prevention and control.

We declare no competing interests. Where authors are identified as personnel of the International Agency for Research on Cancer/WHO, the authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the International Agency for Research on Cancer/WHO.

Copyright © 2020 World Health Organization; licensee Elsevier. This is an Open Access article published under the CC BY NC ND 3.0 IGO license which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. In any use of this article, there should be no suggestion that WHO endorses any specific organisation, products or services. The use of the WHO logo is not permitted. This notice should be preserved along with the article's original URL.

**Ophira Ginsburg, Elisabete Weiderpass*
ophira.ginsburg@nyulangone.org

Perlmutter Cancer Center, Department of Population Health, NYU Grossman School of Medicine, New York, NY 10016, USA (OG); and International Agency for Research on Cancer, Lyon, France (EW)

- 1 Bray F, Ferlay J, Soerjomataram I, Siegel 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.
- 2 Burger EA, Smith MA, Killen J, et al. Projected time to elimination of cervical cancer in the USA: a comparative modelling study. *Lancet Public Health* 2020; published online Feb 10. [https://doi.org/10.1016/S2468-2667\(20\)30006-2](https://doi.org/10.1016/S2468-2667(20)30006-2).
- 3 WHO. Draft: global strategy towards the elimination of cervical cancer as a public health problem. <https://www.who.int/docs/default-source/documents/cervical-cancer-elimination-draft-strategy.pdf> (accessed Jan 22, 2020).
- 4 Centers for Disease Control and Prevention. CDC Newsroom: an estimated 92% of cancers caused by HPV could be prevented by vaccine. <https://www.cdc.gov/media/releases/2019/p0822-cancer-prevented-vaccine.html> (accessed Jan 22, 2020).
- 5 Simms KT, Steinberg J, Caruana M, et al. Impact of scaled up human papillomavirus vaccination and cervical screening and the potential for global elimination of cervical cancer in 181 countries, 2020–99: a modelling study. *Lancet Oncol* 2019; **20**: 394–407.
- 6 US Centers for Medicare and Medicaid Services. Cervical and vaginal cancer screenings. <https://www.medicare.gov/coverage/cervical-vaginal-cancer-screenings> (accessed Jan 30, 2020).
- 7 Centers for Disease Control and Prevention. United States Cancer Statistics: data visualizations. <https://gis.cdc.gov/Cancer/USCS/DataViz.html> (accessed Jan 30, 2020).
- 8 International Agency for Research on Cancer, WHO. Reducing social inequalities in cancer: evidence and priorities for research. Lyon: International Agency for Research on Cancer, 2019.
- 9 Beavis AL, Gravitt PE, Rositch AF. Hysterectomy-corrected cervical cancer mortality rates reveal a larger racial disparity in the United States. *Cancer* 2017; **123**: 1044–50.
- 10 Hu L, Bell D, Antani S, et al. An observational study of deep learning and automated evaluation of cervical images for cancer screening. *J Natl Cancer Inst* 2019; **111**: 923–32.