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The road to cervical cancer elimination in Malaysia



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To achieve the WHO's 90-70-90 three-pillar targets (achieving high-coverage of vaccination, screening and cancer treatment) towards eliminating cervical cancer as a public health problem,¹ countries with their own unique circumstances will have to construct each 'pillar' differently. In Malaysia, cervical cancer is still the third most common and the fourth most deadly cancer among women. Hence, the argument is no longer whether we should be vaccinating and screening but rather prioritising investments and implementing solutions towards the elimination of cervical cancer.

In Malaysia, a high-coverage (>80%) HPV vaccination program has been available for school-aged girls since 2010.² However, the cytology-based screening offered nationally has low coverage (3-yearly coverage has been estimated at <25%).³ This is partly because Malaysia has relied on opportunistic screening, with no registry for follow-up. Other factors include insufficient cytopathologists, lack of space and privacy in primary care facilities, lack of knowledge or time, and fear or embarrassment.⁴

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HPV-based screening pilot trials have recently been conducted in Malaysia. One of these was Project ROSE, now continuing as Program ROSE, which integrated self-sampling, primary HPV screening and a digital registry. 99% of the women screened indicated they would repeat the test again; reasons given by patients included that it was simple, quick, and self-performed.

HPV-based screening pilot trials have recently been conducted in Malaysia. One of these was Project ROSE, now continuing as Program ROSE, which integrated self-sampling, primary HPV screening and a digital registry. 99% of the women screened indicated they would repeat the test again; reasons given by patients included that it was simple, quick, and self-performed.⁴ Provided that the polymerase chain reaction (PCR) is used, self-sampling is comparable to the sensitivity of clinician-collected samples, and higher than the sensitivity of the current Pap tests.⁵ Local experts from Project ROSE worked with the Australian Centre for the Prevention of Cervical Cancer to incorporate canSCREEN, their digital health platform and develop a mobile interface. This allowed women to have an initial result sent to them quickly via SMS, with 91% of those testing positive attending follow-up. As Malaysia transitions to HPV testing, the team at the Daffodil Centre, a joint venture between Cancer Council and the University of Sydney, worked with the local team from University of Malaya to model the future impact of a national scale-up of HPV testing, as well as that of the current vaccination program. The tool to achieve this was Policy1-Cervix, an extensively validated simulation of HPV transmission, vaccination, cervical precancer and cancer, screening, diagnosis and treatment.⁶

If the current vaccination program (blue intervention) were to continue as is, Malaysia could eventually eliminate cervical cancer by the year 2066-2079, saving over 10,000 lives by 2070.

Figure 1 shows how Malaysia's rates* of cervical cancer incidence are projected by the model to change over time, colour-coded according to different interventions. If the current vaccination program (blue intervention) were to continue as is, Malaysia could eventually eliminate cervical cancer by the year 2066-2079, saving over 10,000 lives by 2070.

Adding such screening to already existing vaccination could accelerate the timing of national elimination by over a decade, to 2055-2059.

The figure also shows the effects of further introduction of scaling up twice-lifetime screening in 2023 and reaching 70% coverage by 2030 as demonstrated by Program ROSE (orange intervention). This assumes only a 10% loss in follow up with the support of a registry (including pre-cancer and cancer treatment) and an HPV test with the option for self-sampling. Adding such screening to already existing vaccination could accelerate the timing of national elimination by over a decade, to 2055-2059.

The introduction of screening would nearly double the number of lives saved over the next half-century compared with vaccination alone, to well over 20,000. A key reason for this is that Malaysia's vaccination program is recent: since it is introduced for girls aged 13, then it still only covers women under 25 as of now. Thus, the women being screened at age 35 and 45 are largely unvaccinated and it won't be for another two decades before a woman in a cohort aged 45 will have had the opportunity to receive vaccination within a school-based program. Even then, the current vaccination program protects against HPV16/18, which accounts for 70% of cervical cancer cases** with the remaining cases needing to be captured by screening. **The addition of screening is also cost-effective,** with a cost-effectiveness ratio of being less than the GDP per capita of Malaysia, which is a common yardstick for cost-effectiveness.

Introducing HPV test screening without a digital registry causes a significant reduction in the effectiveness of a screening program, with delays in elimination of 3-7 years and 1800-4900 fewer deaths averted in the next half-century. It is also less cost-effective.

Each component of this screening program is important to its success. For example, introducing HPV testing without a digital registry (**yellow intervention**) could result in higher loss to follow-up of 25-50% for women who need further diagnostics or pre-cancer treatment. This one change causes a significant reduction in the effectiveness of a screening program, with **delays in elimination of 3-7 years and 1800-4900 fewer deaths averted** in the next half-century. Despite the cost of running a digital registry, these are more than counter-acted by the added benefits in lives saved. Moreover, a registry would also ensure that women are not screened more frequently than necessary (every 5 years). Therefore, **without a digital registry in the screening program it is less cost-effective (Figure 1)**.

This modelling work has considered how elimination can be achieved in Malaysia. While effective vaccination is already present, in the

short- to intermediate-term, screening by HPV testing is critical to saving almost twice as many lives, accelerating the timeline to elimination, and allowing for elimination across different regions of Malaysia. Supporting infrastructure such as a digital registry will enable the delivery of both an effective and cost-effective program. ■

FOOTNOTES

*These rates are age-standardised according to the World Female Population 2015 to control for country-specific demographics and allow direct match to the metric used for the definition of elimination (4/100,000).

**All ranges refer to whether bivalent vaccination (which confers cross-protection against some other high-risk types) or quadrivalent vaccination is used. Both of these have previously been used in Malaysia's vaccination program.

DISCLOSURE

YLW has been granted investigator-initiated studies with no money as honoraria (Malaysian HPV Study from Merck Sharp & Dohme, consumables for Project ROSE from ROCHE and Cepheid).

MS is Executive Director at VCS Foundation, a not-for-profit organisation that offers services to implement, support, monitor and manage population health programs. VCS Foundation has developed the canSCREEN digital health platform utilised in Project ROSE, which is a partnership between the University of Malaya and VCS Foundation.

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Figure 1

Rates of cervical cancer incidence in Malaysia, projected by the model to change over time, and colour-coded according to different interventions:

Vaccination only

If the current vaccination program were to continue as is, Malaysia could eventually eliminate cervical cancer by the year 2066-2079, saving over 10,000 lives by 2070.

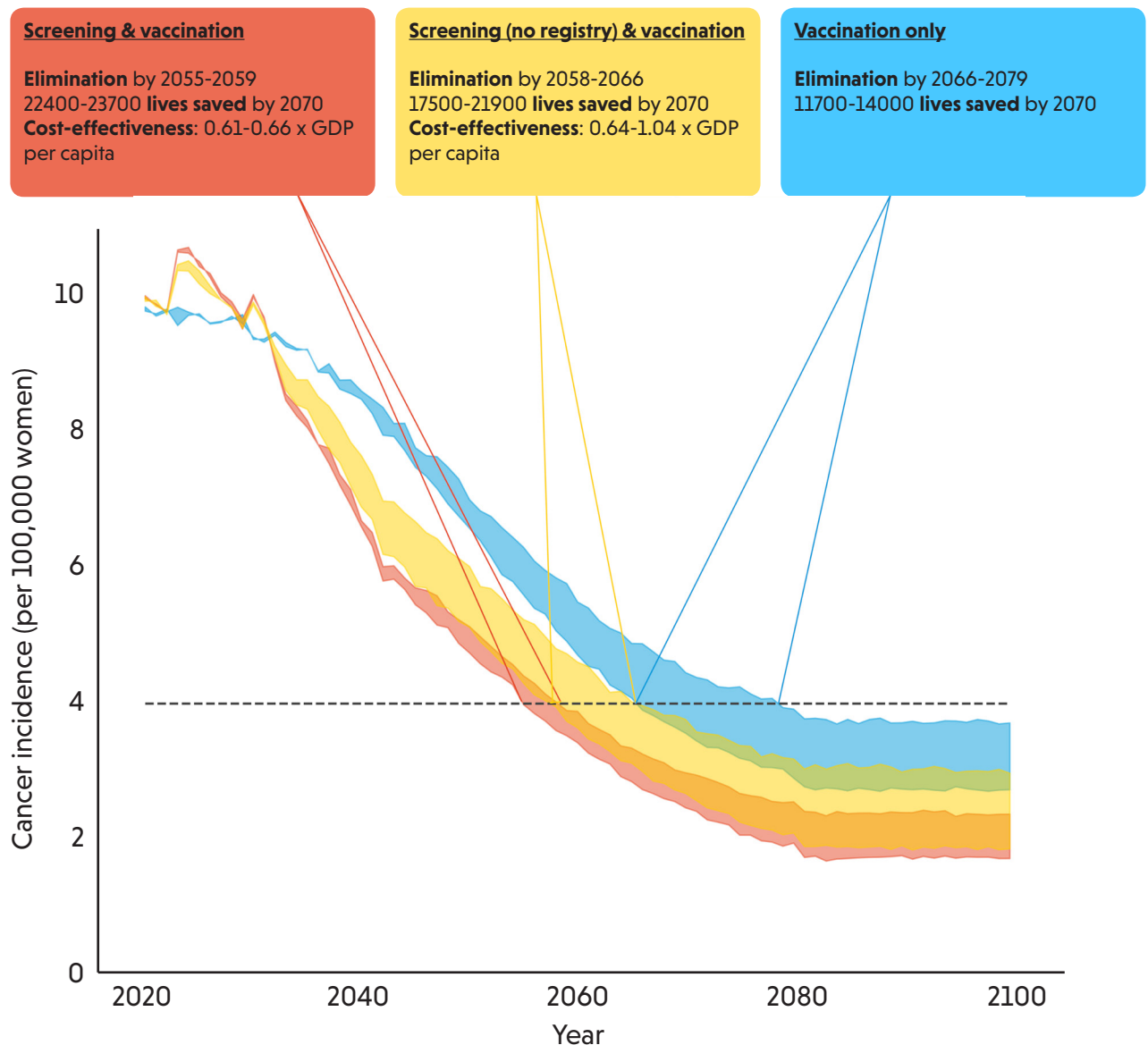
Screening and vaccination

The introduction of screening would nearly double the number of lives saved over the next half-century and is cost-effective, compared with vaccination alone.

Screening (no registry) and vaccination

Introducing HPV testing without a digital registry significantly reduces the effectiveness of a screening program, with delays in elimination of 3-7 years and 1800-4900 fewer deaths averted in the next half-century.

Adapted with permission from Keane et al, 2021.⁶



REFERENCES:

1. World Health Organization. Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem. Launched November 17, 2020. Available from: <https://www.who.int/publications/item/9789240014107> (Last accessed: Feb 26th 2023)
2. Malaysian Ministry of Health. Health Indicators 2019: Indicators for Monitoring and Evaluation of Strategy Health for All; 2020. Earlier reports also used: Health Indicators 2013 through to 2018 (published 2014 through to 2019).
3. Bruni L, Albero G & Serrano B et al. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in Malaysia. Summary Report June 17, 2019. Accessed December 17, 2020. Available from: <https://hpvcentre.net/statistics/reports/MYS.pdf?t=1677613090150>
4. Ferlay J, Ervik M, Lam F, et al. Global Cancer Observatory: Cancer Today; 2018. <https://gco.iarc.fr/today>. (Last accessed: Feb 26th 2023)
5. Arbyn M, Castle PE. Offering self-sampling kits for HPV testing to reach women who do not attend in the regular cervical screening program. *Cancer Epidemiol Biomarkers Prev.* 2015;24(5):769-772. Available from: <https://doi.org/10.1158/1055-9965.epi-14-1417>
6. Keane A, Ng CW, Simms KT, et al. The road to cervical cancer elimination in Malaysia: Evaluation Of the impact and cost-effectiveness of human papillomavirus screening with self-collection and digital registry support. *Int.J. Cancer.* 2021;149(12):1997-2009. Available from: <https://doi.org/10.1002/ijc.33759>

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