

MODELING CERVICAL CANCER ELIMINATION IN MALAYSIA: THE ROLE OF HPV VACCINATION

Siti Rasidah Abd Ghani^{1*}, Mohd Rohaizat Hassan¹, Nazarudin Safian¹

¹Department of Public Health Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Bandar Tun Razak, 56000 Cheras, Wilayah Persekutuan Kuala Lumpur

*Correspondence email: drsitirasidah@moh.gov.my

Introduction

Malaysia has implemented HPV vaccination to immunize young girls age 13 since 2010 to reduce cervical cancer incidence related to HPV 16 and 18 among the vaccinated cohort. This study examines cervical cancer incidence trends over 100 years following HPV vaccination.

Methodology

A predictive SEIRS model was developed, calibrated, and validated using Malaysian cervical cancer incidence data from the National Registry and published literature. The model was employed to analyze a range of scenarios, incorporating varying vaccination coverage and efficacy rates, alongside considerations for CIN3/CIS and cervical cancer screening and treatment. The projection of cervical cancer incidence was performed by setting up the model to 85% vaccine coverage, 95% vaccine efficacy, with catch-up vaccination up to age 16 years.

Results

With 85% vaccine coverage, the model projects a 12% reduction in cervical cancer incidence after 20 years, 36.5% after 50 years, and 64.8% after 100 years. The crude cervical cancer incidence rate in Malaysia is projected to decrease from 5.5 per 100,000 women in 2010 to 4.5 per 100,000 in 2030 and 3.8 per 100,000 in 2060 and further decrease to 3.0 per 100,000 women in 2110. The age-standardized (ASR) rate falls below the elimination threshold, which is less than 4 per 100,000 women in 2050. With the HPV vaccine only without effective screening and treatment, the ASR falls below the elimination threshold between 2075 to 2080.

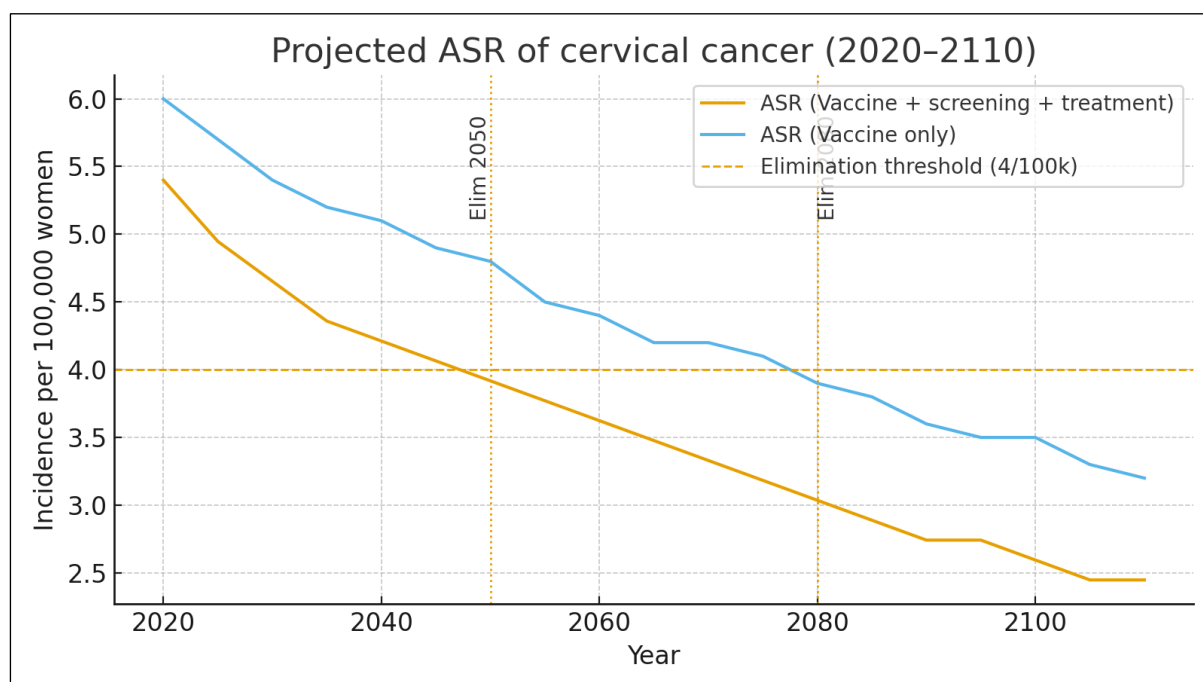


Figure 1. Projected Age-standardized incidence rate of cervical cancer in Malaysia from 2020 to 2110

Discussion

High HPV vaccination coverage and vaccine efficacy alongside effective treatment and screening enable Malaysia to reduce cervical cancer incidence within 40 years and achieve the elimination target by 2050.

Keywords: HPV vaccination, cervical cancer, Malaysia, incidence trend, SEIRS Model, elimination target, vaccination coverage, vaccine efficacy, Age-Standardized Rate