Domestic HPV vaccine price and economic returns for cervical cancer prevention in China: a cost-effectiveness analysis

Authors:
Zou Z¹, Fairley CK¹-³, Ong JJ¹-³, Hocking J¹,⁵, Canfell K⁶-⁸, Ma X¹, Chow EPF²-⁵, Xu X¹-³, Zhang L¹-⁴, Zhuang G¹

1. China-Australia Joint Research Centre for Infectious Diseases, School of Public Health, Xi’an Jiaotong University Health Science Centre, Xi’an, Shaanxi, China
2. Melbourne Sexual Health Centre, Alfred Health, Melbourne, Australia
3. Central Clinical School, Faculty of Medicine, Monash University, Melbourne, Australia
4. Department of Epidemiology and Biostatistics, College of Public Health, Zhengzhou University, Zhengzhou, Henan, China
5. Sexual Health Unit, Melbourne School of Population and Global Health, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Australia
6. Cancer Research Division, Cancer Council NSW, Sydney, NSW, Australia
7. Prince of Wales Clinical School, The University of New South Wales, Australia
8. School of Public Health, University of Sydney, Australia

Background:
Coinciding with the recent release of the first Chinese domestic human papillomavirus (HPV) vaccine, Cecolin, and the substantial advancements in cervical cancer screening technology, we evaluated the cost-effectiveness of the combined strategies of cervical cancer screening programmes and universal schoolgirls vaccination with Cecolin in China.

Methods:
We developed a Markov model of cervical cancer to evaluate the incremental cost-effectiveness ratios (ICERs) of sixty-one intervention strategies, including a combination of various screening methods at different frequencies with and without vaccination, and also vaccination alone, from a healthcare system perspective. We conducted univariate and probabilistic sensitivity analyses to assess the robustness of the model findings.

Results:
Compared with 'no intervention', various combined screening and vaccination strategies would incur an additional cost of US$6,157,000–22,146,000 and result in 691–970 quality-adjusted-life-years (QALYs) gained in a designated cohort of 100,000 schoolgirls over a lifetime. With a willingness-to-pay (WTP) threshold of 3-time Chinese per-capita gross domestic product (GDP), 5-yearly careHPV screening with vaccination would be the most cost-effective strategy with an ICER of US$21,799/QALY compared with the lower-cost non-dominated strategy on the cost-effectiveness frontier, and the probability of it being cost-effective (44%) outperformed other strategies. Strategies that combined screening and vaccination would be more cost-effective than screening alone strategies when the vaccination cost was below US$50/2 doses, even with a lower WTP of 1-time per-capita GDP.

Conclusions:
Five-yearly careHPV screening with vaccination is the most cost-effective strategy. Reduction in domestic HPV vaccine price is necessary to ascertain a good economic return for the future vaccination programme.

Disclosure of Interest Statement:
None declared.