The Health Economic Value of HPV Multi-genotype Detection Technology under Cervical Cancer Screening Strategy in China

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Introduction

Cervical cancer is the most common female reproductive malignancy in clinical practice.

Its incidence and mortality ranks fourth in the world among female cancers.

The incidence is on the rise in China.

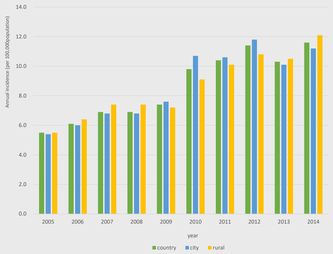


Figure1. Incidence of cervical cancer in China from 2005 to 2014

The cause is clear and preventable.

Application and Development of Screening Technology.

Many HPV detection methods

lack of validity verification

How to manage HPV-positive, cytology-negative patients

Refinement of follow-up diagnosis and treatment procedures may further improve cost effectiveness

Objectives

HPV multi-genotype testing can further identify non-HPV 16/18/45 genotype infections.

Different HPV high-risk types have different pathogenic risks for CIN3+.

problem

HPV Multi-genotype VS. HPV partial genotype（16/18 typing）

Screening process

Medical Resource Utilization

Cost Effect

Objective

- Provide parametric support for the construction of economic evaluation models
- Evaluate the long-term effects and cost of two testing technologies
- Based on the results, countermeasures and suggestions are put forward for different screening strategies

Methods

Figure2. research methods

Methods

Model building

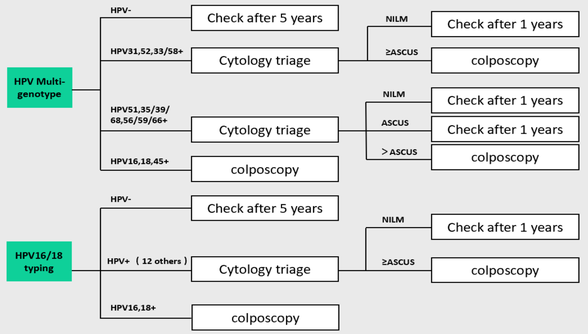


Figure3. Path diagram of two types of detection models

- the initial state of the population:1 million healthy women with an initial age of 15 years.
- Initial screening age is 21 years
- Model cycle: 1 year

Model analysis

- **Cost**: Various direct medical expenses.
  Screening + diagnosis + treatment
- **Effect:** Simulates 10, 20, 30, 40, 50 years respectively.
  - Number of reduced cervical cancer cases reduced by the two strategies compared to the natural regression model
  - Number of colposcopies
  - Screening rate of cervical precancerous lesions (CIN1 - CIN3)
- **Cost-effectiveness analysis :** ICER
- **Sensitivity Analysis (single factor)**

Results

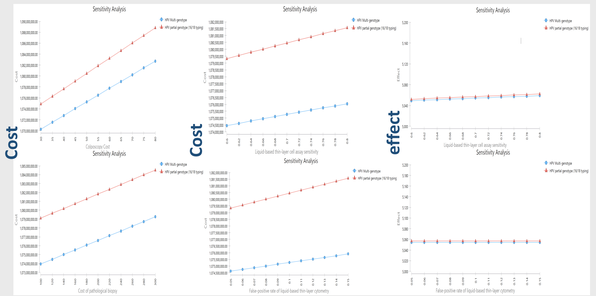
Simulation of 50 years as an example

- **Cost-effectiveness analysis**

years	items	③ HPV Multi-genotype	④ HPV partial genotype (16/18 typing)	Difference (③-④)
50 years	cost （million yuan)	1075.27	1080.46	-5.20
	effect （cases)	5054	5057	-3
	Number of colposcopies	405838	453393	-47556
	Screening rate of CIN	76.23%	84.74%	-8.51%

ICER: 1.71 million yuan/case (compared to HPV Multi-genotype)

- **Sensitivity Analysis:**



Conclusions

- HPV Multi – genotype reduce cost, colposcopy frequency and screening rate of CIN significantly while maintaining the nearly effectiveness as HPV partial genotype, thus reducing excessive waste of resources.
- Policy makers can prioritize HPV Multi-genotype in cervical cancer screening selection.

References

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