

Economic Evaluation of Universal Varicella Vaccination in Mexico

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BACKGROUND

Universal varicella vaccination (UVV) has proven to be cost-effective in countries where implemented. However, this has not yet been evaluated for Mexico. We assessed the cost-effectiveness of UVV in the Mexican Immunization Program from both healthcare and societal perspectives

METHODS

Due to the lack of information on varicella disease burden in Mexico (not a Mexican National notifiable disease), yearly disease burden (varicella cases/deaths, outpatient visits and hospitalizations) were derived from Mexican seroprevalence-published data (1) adjusted to the 2020 country's population. The annual economic burden was calculated by combining disease with Mexican published unit cost data (2, 3). Four different vaccination strategies were evaluated: 1. One dose of a single varicella vaccine at 1 year old; 2. Two doses of single varicella vaccine at 1 and 6 years; 3. One dose of a single varicella vaccine at 1 year, and quadrivalent measles-mumps-rubella-varicella vaccine (MMRV) at 6 years; 4. Two doses of MMRV at 1 and 6 years.

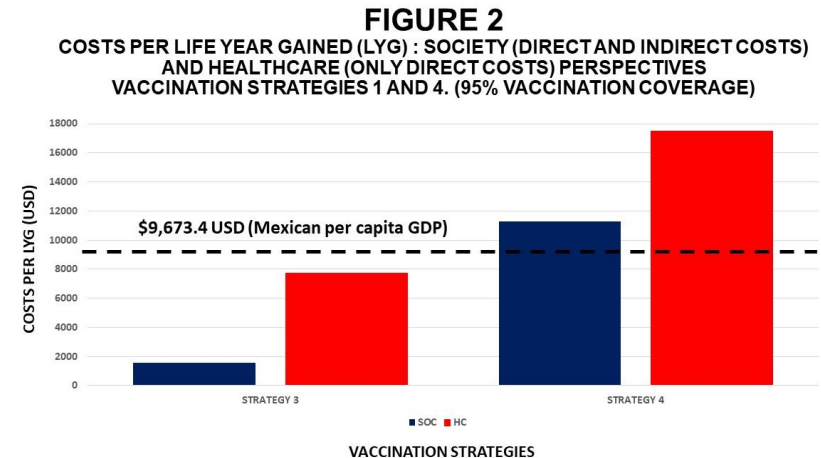
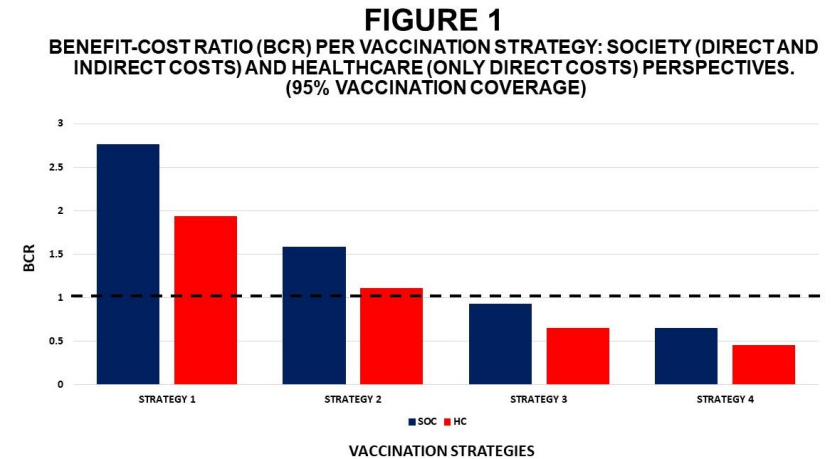
We developed an economic model for each vaccination strategy where 20 consecutive birth cohorts were simulated. The impact of vaccination (number of avoided cases/deaths) was evaluated for a 20 years follow-up period based on vaccine effectiveness (87% and 97.4%), and assuming a 95% coverage. Subsequently, based on PAHO vaccine-costs' list (4), as well as direct information of MMRV cost (not included in PAHO list), we estimated net vaccination costs, benefit-cost ratio (BCR), annual costs saved, cost-effectiveness ratio.

RESULTS

A total of 2,041,296 annual cases of varicella were estimated, representing a total of 1,177,606 outpatient visits, 5,290 hospitalizations, and 188 deaths. From the 20 years cohort and the yearly number of varicella episodes already mentioned, avoided cases with one dose, and two doses were of 20,570,722 and 23,029,751, respectively, and with an estimation of total costs of \$115,565,315 (USD) (healthcare perspective), and \$165,372,061 (healthcare and societal perspective). Strategies 1 and 2 were found to be cost-saving (BCR>1) (Figure 1), and strategy 3 to be cost-effective (CE) (\$1539 per Life Year Gained) (Figure-2). Strategy 4 was not CE. Strategies 1 and 2 would allow saving annually \$53.16 million and \$34.41 million, respectively, to the Mexican society.

References:

- 1.- Conde-Gonzalez C, et al. Vaccine 2013; 31(44): 5067–74.
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4. https://www.paho.org/hq/index.php?option=com_docman&view=download&category_slug=revolving-fund-2625&alias=25038-revolving-fund-vaccine-prices-038&itemid=270&lang=en



CONCLUSIONS

1. The disease and economic burden of varicella in Mexico is high.
2. UVV with 4 different vaccination strategies results in a high reduction of cases.
3. Strategies 1 and 2 were found to be cost-saving (Figure 1), and strategy 3 to be cost-effective (\$1,539 per LYG). Strategies 1 and 2 would allow saving annually \$53.16 million and \$34.41 million, respectively, to Mexican society.