Cost Effectiveness of Universal Screening for Measles Immunity in Pregnancy

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Background

- Vaccination rates for measles-mumps-rubella (MMR) have declined and there have been over a dozen measles outbreaks in the US in 2024.
- Routine prenatal screening for rubella immunity is currently recommended, but not for measles immunity.
- Our group previously noted that 19% of rubella immune individuals in Los Angeles were measles non-immune. *(Kassir, AJP 2024)*

Objective

- To examine the cost-effectiveness of universal screening for measles immunity in pregnancy.

Study Design

- Cost-effectiveness analysis of universal screening for measles immunity compared to no screening using a Markov model.
- Model inputs were derived from the literature and varied in sensitivity analyses.
- Outcomes included: measles exposure, measles infection including mild and severe infections, maternal death, fetal death, preterm delivery, vaccination, vaccine response, cost, and quality-adjusted life years (QALYs).
- Assumptions include vaccination occurs postpartum and the occurrence of a subsequent pregnancy.
- Willingness-to-pay threshold was set at $100,000 per QALY.

Results

- **Universal screening for measles immunity was the dominant strategy; even when varying the measles exposure rate.**
- Using the current measles rate of 0.1%, the incremental cost effectiveness ratio (ICER) of universal screening versus no screening was **$25.07/QALY.**
- Tornado one-way sensitivity analyses demonstrated costs of measles screening and cases, maternal death, MMR vaccination, and measles exposure had greatest impact on the cost-effectiveness of screening.
- Univariate sensitivity analysis demonstrated that universal screening for measles was cost-saving until the cost of testing for measles immunity passed $3,957, far exceeding the current average cost of screening, $44.

Universal screening for measles immunity in pregnancy is a cost-effective strategy compared to no screening.

Questions? Email Dr. Devabhaktuni at adevabhaktuni@mednet.ucla.edu

Figure 1: Univariate sensitivity analysis of measles exposure

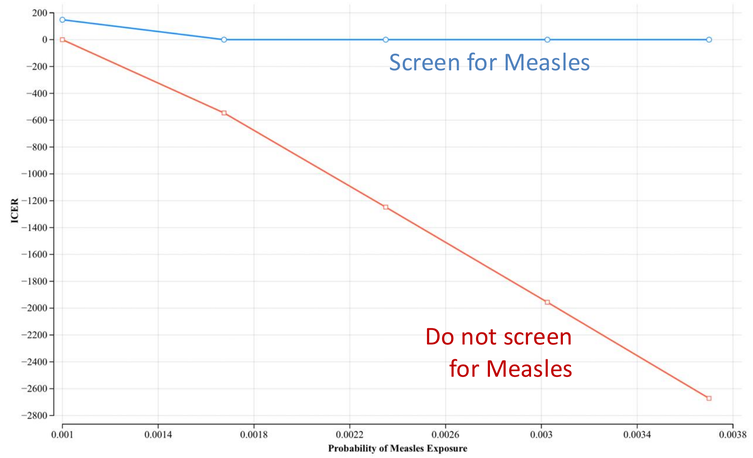
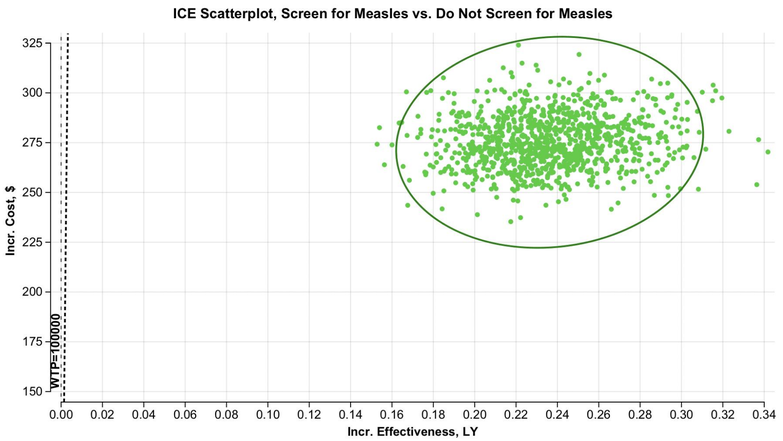


Figure 2: Monte Carlo analysis indicating cost-effectiveness of universal measles screening in pregnancy in 99.83% of trials



Conclusion

Universal screening for measles immunity during pregnancy is a cost-effective strategy. Prenatal guidelines should be updated to recommend universal screening for measles immunity in pregnant and preconception patients, and subsequent postpartum vaccination to ensure protection from measles in a subsequent pregnancy.