Family spillover effects in vaccine cost-effectiveness analysis

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Purpose

- We assessed the inclusion of family spillover effects in cost-effectiveness analyses (CEA) of commonly evaluated vaccines
- We defined family spillover effects as the impact of disease on noninfected family

Figure 1. Number of articles per type of family spillover effect



members that care for or about the patient

Methods

- We reviewed vaccine CEAs published between 2018 and 2022 using the Tufts Medical Center CEA Registry
- We selected CEAs conducted from the societal perspective for the four vaccines most evaluated within our search: human papillomavirus (HPV), influenza, pneumococcal disease, and rotavirus
- We examined the frequency in which studies considered family spillover costs and/or health effects, and the impact of their inclusion on the results

Figure 2a. Change in ICER with addition of family spillover





Conclusions

- Approximately half of vaccine CEAs conducted from a societal perspective neglected family spillover effects
- Among studies that did consider family spillover effects, they typically included family spillover costs but rarely health effects

Results

Inclusion and exclusion criteria

- Identified 153 vaccine CEAs published from 2018-2022 from a societal perspective
- Excluded 7 non-English studies and 77 studies for vaccines that were not among the top four most studied
- Final sample: 69 eligible CEAs

Table 1. Frequency of family spillover effects in eligible CEAs

Vaccine type	Included family spillover	Did not include family spillover	Total
HPV	2 (25.0%)	6 (75.0%)	8
Influenza	15 (48.4%)	16 (51.6%)	31
Pneumococcal	8 (36.4%)	14 (63.6%)	22
Rotavirus	1 (11.1%)	8 (88.9%)	9

- Incorporating family spillover effects generally resulted in more favorable CEA results in vaccine CEAs
- Future work should consider different modeling approaches suitable for repeated events and time-to-event analyses
- While challenges remain, establishing external validity and replicability for predictive models are critical for real-world applications

Limitations

We examined a limited number of years for this pilot study. Future research will evaluate vaccine CEAs published between 2013 and 2022

Data source

Tufts Medical Center CEA Registry, 2018-2022





This work was funded by Merck Sharp & Dohme LLC, a subsidiary of Merck & Co., Inc.,

Rahway, NJ, USA.

Presented at ISPOR Europe; Barcelona, Spain; 17-20 November 2024

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