

Systematic Review of Cost-effectiveness Analyses on U.S. Adult Vaccines

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Abstract

The adult vaccine schedule provides recommendations on the use of vaccines to reduce the burden of vaccine-preventable diseases among U.S. adults ≥ 19 years. Coverage levels among many vaccines recommended for U.S. adults ≥ 19 years remain lower than childhood vaccine coverage levels and remain below targets set by *Healthy People 2020*¹. The cost-effectiveness research literature on adult vaccines has not been synthesized in recent years, which may contribute to low awareness of the value of adult vaccines and may contribute to under-utilization of adult vaccines. This study conducted a systematic review of the research literature since 1980. We identified 1,688 records from the systematic search. After removing duplicates and off-topic studies, we identified 143 papers for full-text review related to influenza (42), Tdap (16), zoster (7), pneumococcal (26), hepatitis B (17), human papillomavirus (24), and multiple vaccines (11). Preliminary results suggest cost-effectiveness studies consistently found positive economic value associated with adult vaccinations.

Preliminary results (study in progress)

- Several studies of adult influenza and pneumococcal vaccinations identify economic values that are considered cost-saving, which indicates the use of vaccines confer greater or equivalent health outcomes with lower costs.
- The majority of studies across all adult vaccines appear to identify economic values that would likely be considered cost-effective.
- Among adults, lower cost-effectiveness ratios have been associated with certain high-risk populations, such as the elderly (influenza and pneumococcal), immunocompromised (pneumococcal), and pregnant women (influenza).

Figure 1. Cascade diagram of systematic review

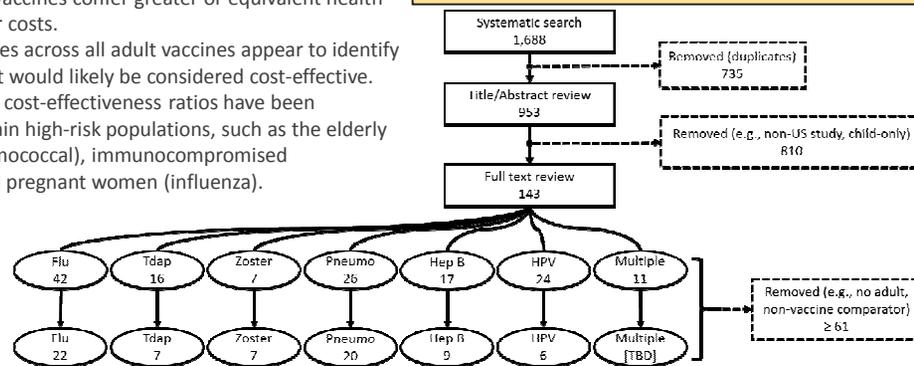


Table 1. Summary of cost-savings and cost-effectiveness results from systematic review

Vaccine	Summary information		Cost-savings results		Cost-effectiveness results			
	Number of studies	Relevant outcomes (max 3 per study)	Outcomes as \$ or \$/QALY	Portion indicating cost-savings	Outcomes as \$/QALY	Portion indicating...		
						CERs \leq \$50k	CERs \leq \$100k	CERs \leq \$300k
Influenza	22	43	39	0.46	21	0.95	0.95	1.00
Pneumococcal	20	44	44	0.36	36	0.72	0.89	0.92
Human papillomavirus	6	12	12	0.00	12	0.50	0.67	1.00
Zoster	7	18	18	0.00	18	0.72	0.89	0.94

*Assessment of Tdap, hepatitis B, and multiple vaccine studies are in progress. QALY=quality-adjusted life-year; CER=cost-effectiveness ratio; Pneumo=pneumococcal; Tdap=tetanus, diphtheria, and acellular pertussis; HPV=human papillomavirus; Hep B=hepatitis B;

Introduction

A recent study by CDC concluded that coverage for all U.S. adult vaccines remains low¹. Lower vaccination coverage rates could be due to the perceived clinical and economic value of adult vaccines held by providers or by patients. This study seeks to survey, understand, and summarize the cost-effectiveness literature on adult vaccinations.

Methods

- Systematic search of medical and economic research literature
 - PubMed, Embase, Cochrane Libraries (Economic Evaluations), EconLit
- Search terms:
 - (cost-effectiveness OR cost-utility) AND (vaccine OR vaccination OR immunization) AND [vaccine or vaccine preventable diseases-specific terms]
- Exclusion criteria
 - Child-only results
 - Non-US, non-Canadian, or non-English language
 - Study did not contain an adult non-vaccine comparator scenario
- Standardized form was used to abstract data from all included studies
 - Up to three relevant outcomes could be recorded for each study
- Tabulation and data analysis performed using R statistical package

Conclusions & Discussion

- Preliminary results found that the majority of economic studies of influenza, pneumococcal, human papillomavirus, and zoster vaccination of adults reported cost-effectiveness ratios (CERs) \leq \$100,000/QALY.
 - Many influenza and pneumococcal vaccination studies reported cost-savings.
- Efforts are needed to improve providers, payers and healthcare systems awareness regarding the value provided by adult vaccinations.

References

¹ Williams et al. 2014. Noninfluenza vaccine coverage among adults—United States, 2012. MMWR

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