The Economic Burden of COVID-19 Vaccine Hesitancy: A Systematic Literature Review

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BACKGROUND

Vaccine hesitancy was named as one of the top ten threats to global health in 2019 by the World Health Organization.[1]

Although the clinical and economic benefits of vaccination are well established, **the economic impact of COVID-19 vaccine hesitancy has yet to be quantified.**

This literature review seeks to describe the economic burden associated with COVID-19 vaccine hesitancy throughout the course of the pandemic.

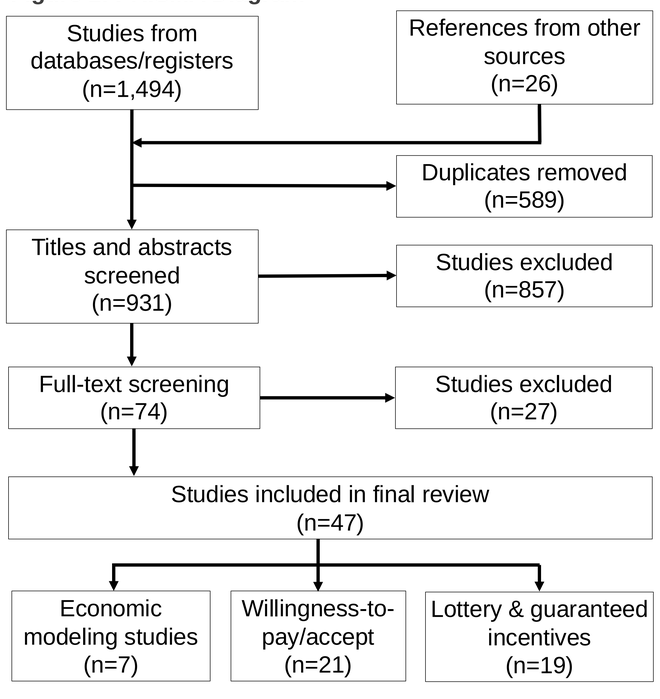
METHODS

PubMed, Embase, EconLit, ProQuest, & **Scopus** were searched from March 1, 2020, to September 8, 2023, for articles on the economic costs of COVID-19 vaccine hesitancy, following PRISMA 2020 checklist criteria.

The search strategy was developed using keywords related to **COVID-19, vaccine hesitancy, and economic costs.** Inclusion criteria for article type includes English language, conference abstracts, and full-text publications that estimated the costs of COVID-19 vaccine hesitancy through modeling, willingness to pay, or incentive studies.

RESULTS

Figure 1: PRISMA Diagram



RESULTS

The review included a total of 47 articles, with 7 **economic modeling studies** forecasting vaccine hesitancy costs, 21 studies on willingness-to-pay (**WTP**) and willingness-to-accept (**WTA**), and 19 studies on **lottery and guaranteed incentive** schemes and their impact on vaccine uptake.

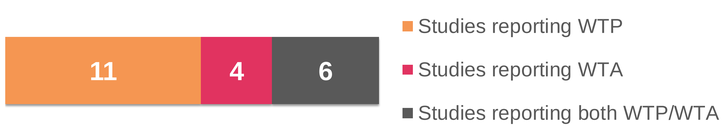
Economic Modeling and Cost Studies

Table 1: Summary of Economic Modeling and Cost Analyses (n=7)

Author	Country	Study Design	Results
Amin et al, 2021	United States	Retrospective cohort analysis	From June through November 2021, preventable COVID-19 hospitalizations among unvaccinated adults cost over $13B
Bagshaw et al, 2022	Canada	Retrospective cohort analysis	Unvaccinated persons resulted in $61.3M of avoidable ICU costs between September 2021– January 2022
Bartsch et al, 2021	United States	Computational model	For every 1% increase in vaccination coverage (between 40%-50% total coverage) $602.8M would be saved in direct medical costs and $1.3B in productivity losses
Bruns et al, 2021	United States	Regulatory impact analysis	Total voluntary COVID-19 non-vaccination has caused at least $1B of harm each day in the United States since vaccines became widely available – in June-July 2021
Council of Canadian Academies, 2023	Canada	Computational model	Unvaccinated people who believed COVID-19 is a hoax or exaggerated added $300 million CAD to hospitalization and ICU costs in Canada in March-November 2021
Liu et al, 2023	Global (27 African Countries)	Cost-effective analysis	At all income levels, medium and fast vaccine roll-out scenarios are associated with lower ICERs relative to GDP per capita compared to slow
Oliu-Barton et al, 2022	Global (OECD Countries)	Time series cross-country regression analysis	Full vaccination across France, Germany, and Italy would recover 85% of the GDP lost in 2020

WTP & WTA Studies

Figure 2: Outcomes reported in WTP/WTA Studies (n=21)



The 21 WTP/WTA studies were conducted across multiple countries including Chile (n=2), China (n=5), Ecuador (n=1), India (n=2), Ethiopia (n=1), Indonesia (n=1), Kenya (n=1), Malaysia (n=2), Namibia (n=1), Nigeria (n=1), Vietnam (n=1), Romania (n=1), and the US (n=3). The number of respondents in each study ranged from **301 to 4,164**.

Participants' mean WTP for vaccination ranged from (n=15):

$1.60 ⟷ **$259.51**

The percentage of patients willing to accept vaccination at no cost ranged from (n=8):

40.8% ⟷ **100%**

Vaccine Hesitancy Lottery and Guaranteed Incentive Studies

Among the 19 studies reporting COVID-19 vaccine lottery and guaranteed incentives, a majority were performed in the US (n = 17) and the remaining in Germany (n = 2).

Lottery incentives ranged from:

$34K ⟷ **$5M**

Guaranteed incentives ranged from:

$10 ⟷ **$10K**

Statewide incentive programs for COVID-19 included lottery and guaranteed incentives with the following values:

- **Lottery Prizes:** OH, CO, NY, NM, WA, NC, MA, DE, MI, ME, IL, LA, NV, MO, AR, and CA offered cash incentives ranging from **$302,000 to $5 million**, with some states offering **multiple million-dollar** prizes (OH, CO, NC, MA, MI)
- **Gift Cards/Passes:** CT (free drink), NJ (state park pass), MN ($25 ticket/pass), CA ($50 gift card), AR ($20 game/fish certificate), and WV ($100 gift card/US treasury bond)

CONCLUSIONS

The economic burden of vaccine hesitancy includes factors such as **illness-related costs, productivity losses,** and **expenses of interventions and incentives to boost vaccine demand** and is valued in the **billions of dollars** for high income countries, highlighting the importance of targeting underlying causes of hesitancy, such as misinformation.

Through utilizing these data, policymakers will be better equipped to **forecast costs** when planning to roll out vaccination programs or other public health measures to combat vaccine hesitancy.

REFERENCES

1. Abkar R. Ten Threats to Global Health in 2019: World Health Organization 2019. Accessed September 24, 2024. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019

Abbreviations: AR, Arkansas; B, Billion; CA, California; CAD, Canadian Dollar; CO, Colorado; COVID-19, Coronavirus Disease 2019; DE, Delaware; GDP, Gross Domestic Product; ICU, Intensive Care Unit; ICER, Incremental Cost-Effectiveness Ratio; IL, Illinois; K, Thousand; LA, Louisiana; M, Million; MA, Massachusetts; ME, Maine; MI, Michigan; MO, Missouri; NC, North Carolina; NM, New Mexico; NV, Nevada; NY, New York; OECD, Organization for Economic Co-operation and Development; OH, Ohio; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; US, United States; WA, Washington; WTA, Willingness to Accept; WTP, Willingness to Pay