



Cost-Effectiveness Analysis of Bivalent Respiratory Syncytial Virus Prefusion F (RSVpreF) Maternal Vaccine for the Prevention of RSV Illness Among Infants in Hong Kong

Victoria Wong , Michael Fung , Robyn Kendall , Luka Ivkovic , Amy W. Law , Diana Mendes

PII: S1201-9712(26)00138-4
DOI: <https://doi.org/10.1016/j.ijid.2026.108503>
Reference: IJID 108503

To appear in: *International Journal of Infectious Diseases*

Received date: 28 July 2025
Revised date: 13 February 2026
Accepted date: 23 February 2026

Please cite this article as: Victoria Wong , Michael Fung , Robyn Kendall , Luka Ivkovic , Amy W. Law , Diana Mendes , Cost-Effectiveness Analysis of Bivalent Respiratory Syncytial Virus Prefusion F (RSVpreF) Maternal Vaccine for the Prevention of RSV Illness Among Infants in Hong Kong, *International Journal of Infectious Diseases* (2026), doi: <https://doi.org/10.1016/j.ijid.2026.108503>

This is a PDF of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability. This version will undergo additional copyediting, typesetting and review before it is published in its final form. As such, this version is no longer the Accepted Manuscript, but it is not yet the definitive Version of Record; we are providing this early version to give early visibility of the article. Please note that Elsevier's sharing policy for the Published Journal Article applies to this version, see: <https://www.elsevier.com/about/policies-and-standards/sharing#4-published-journal-article>. Please also note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2026 Published by Elsevier Ltd on behalf of International Society for Infectious Diseases.
This is an open access article under the CC BY-NC-ND license
(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Highlights

- Maternal RSVpreF vaccine is approved in Hong Kong to protect infants from RSV
- Clinical and economic outcomes associated with RSVpreF in Hong Kong were assessed
- RSVpreF vaccination could prevent 10% of hospitalizations at 20% vaccine uptake
- US\$300,000 could be saved in direct medical care costs with RSVpreF vaccination
- RSVpreF vaccination is cost-effective in Hong Kong (ICER = US\$45,776 per QALY)

Journal Pre-proof

Cost-Effectiveness Analysis of Bivalent Respiratory Syncytial Virus Prefusion F (RSVpreF) Maternal Vaccine for the Prevention of RSV Illness Among Infants in Hong Kong

Victoria Wong¹, Michael Fung¹, Robyn Kendall², Luka Ivkovic², Amy W. Law³, Diana Mendes^{*4}

¹Pfizer

²Evidinno Outcomes Research, Vancouver, British Columbia, Canada

³Pfizer Inc, New York, New York, United States

⁴Pfizer Ltd., Tadworth, United Kingdom

*Corresponding Author:

Diana Mendes

Walton Oaks - Dorking Road, Tadworth KT20 7NS, UK

Diana.Mendes@pfizer.com

+44 7775 033176

Current Word Count (limit 3,500): 3,252

Abstract

Objectives: Respiratory syncytial virus (RSV) is a leading cause of hospital admissions for acute respiratory infection among infants. A novel RSV prefusion F protein subunit (RSVpreF) vaccine has been recently approved in Hong Kong. The clinical and economic burden of RSV among infants in Hong Kong, with and without a year-round RSVpreF maternal vaccination program, was evaluated.

Methods: A Markov model was used to estimate clinical and economic outcomes of RSV from birth to one year of age for maternal vaccination with RSVpreF compared to no intervention. Analyses were conducted from the healthcare system perspective, with direct costs (2025 United States dollars [US\$]) and outcomes discounted at 3% annually; scenario and sensitivity analyses assessed the robustness of the model.

Results: Compared to no intervention, a year-round RSVpreF vaccination program with 20% uptake would prevent 113 hospitalizations and 256 outpatient encounters annually, averting US\$300,000 in direct medical costs and saving 40 quality-adjusted life years (QALYs). The incremental cost-effectiveness ratio (ICER) was US\$45,776/QALY gained, falling below the threshold of 1 x gross domestic product per capita (US\$56,840).

Conclusions: Year-round RSVpreF maternal vaccination would substantially reduce RSV's clinical and economic burden among infants in Hong Kong and would be a cost-effective program.

Keywords: Cost-effectiveness; Respiratory syncytial virus (RSV); RSVpreF vaccine; Maternal immunization; Hong Kong; Bronchiolitis.

Introduction

Respiratory syncytial virus (RSV) is the main contributor to lower respiratory tract infections (LRTIs) in children under the age of five years worldwide, with highest incidence among infants under six months of age [1]. Each year globally, in infants up to six months old, there are an estimated 6.6 million RSV-associated episodes, 1.4 million RSV-associated hospital admissions, and 45,700 RSV-attributable deaths [1]. Keeping with global patterns, in Hong Kong, according to data from the Centre for Health Protection of the Department of Health in 2023, the annual cumulative RSV-associated hospitalization rates for children aged under five years ranged from approximately 900 to 1,300 hospitalizations per 100,000 population [2]. In the Prince of Wales Hospital, which provides tertiary pediatric intensive care unit (PICU) service for children younger than 12 years in Hong Kong, the length of hospital stay for infants with RSV admitted to PICU was 8.5 days, and 3.0 days for non-PICU admitted cases [3].

A novel RSV prefusion F protein (RSVpreF) vaccine has been approved in 2024 for use among pregnant women at 32 to 36 weeks of gestation to prevent severe LRTI caused by RSV in infants from birth through six months of age [2]. In January 2025, the Scientific Committee on Vaccine Preventable Diseases (SCVPD) under the Centre for Health Protection of the Department of Health reached the consensus that the RSVpreF vaccine is effective in preventing severe RSV-associated LRTI among infants born to vaccinated mothers for up to six months after birth [2]. The current recommendation is that pregnant women may receive RSV vaccination to protect their newborn infants against RSV

disease as an individual decision under informed consent in consultation with their family doctor or doctor providing prenatal care.

For this study, the objective was to evaluate the clinical and economic burden of RSV-LRTI among infants in Hong Kong by performing a cost-effectiveness analysis comparing an RSVpreF maternal vaccination program against the standard of care, which is no intervention, from the Hong Kong public healthcare system perspective.

Methods

Model Structure

A hypothetical cohort Markov model was constructed to predict the clinical outcomes and costs related to RSV infections among newborns from birth to one year of age (Supplementary Figure 1). The model population was based on weeks of gestational age (wGA) at birth. Infants were assumed to be either protected against RSV by maternal vaccination or assumed to not receive any intervention. Clinical outcomes and costs were estimate based on the infants' age of infection, wGA at birth, RSV infection rates, and infant mortality rates (which also varied by age, wGA at birth, and calendar month). Clinical outcomes included RSV hospitalizations, outpatient cases, RSV-related deaths (for hospital admitted patients), life years (LYs), and quality-adjusted life years (QALYs). Economic outcomes consisted of the cost of RSVpreF maternal vaccine and the costs associated with RSV-related hospitalizations and outpatient care visits.

Population

The number of pregnant women giving birth in a given calendar year (33,248) was based on Hong Kong Census and Statistics Department data [4]. The number of infants (including stillbirths) (33,373) was based on the on Johnston's archive data [5]. Distribution of births over calendar months and percentage of liveborn and stillborn infants per term status are described in Supplementary Table 1 and 2, respectively.

Epidemiology

The annual incidence rates of RSV hospital encounters were obtained from a 15-year study (1998-2012) conducted at the Prince of Wales Hospital, one of the largest hospitals

in the city of Hong Kong, using the average annual incidence of RSV-associated hospitalization [6], while annual rates of RSV outpatient encounters were derived from age-specific incidence ratios of RSV hospitalizations and outpatient encounters in Singapore (Supplementary Table 3) [7]. All hospitalized cases of RSV infection were assumed to present as LRTIs. Among outpatient cases, 65% of infections in infants aged 0-6 months and 30% in those aged 6-12 months were assumed to manifest as LRTIs. In absence of Hong Kong-specific data, these proportions were based on the United States (US) data [8]. Furthermore, given the paucity of local data, the distribution of hospitalizations and outpatient cases by month of age was assumed to be the same as in the US [9, 10]. The annual incidence rates of RSV emergency department encounters were not included in the analysis due to the lack of reliable data. Age-specific relative rates of RSV by term status were based on a US study, which reported cases by gestational age at birth and chronological age at infection (Supplementary Table 4). The distribution of RSV encounters by calendar month in all settings is described in Supplementary Table 5.

Mortality

The age-specific rates of infant mortality were estimated based on the Hong Kong Census and Statistics Department data from 2021 (Supplementary Table 6) [11], and were allocated across month of age and term status based on 2019 US Centers for Disease Control and Prevention (CDC) WONDER (Supplementary Table 7). The case-fatality rate (1.1 deaths per 100 hospitalizations) was based on a recent systematic review and meta-analysis [12].

Vaccination Effectiveness and Strategy

Vaccine effectiveness was defined from data collected in the “MATISSE” clinical trial, which provided cumulative efficacy information for the primary trial endpoints up to six months [13]. Vaccine effectiveness was assumed to decline by month of age and was assumed to decline linearly from six months to 0% by nine months of age (Supplementary Figure 2) [13]. The assumption of protection beyond six months is supported by findings from the BERNI study, which reported vaccine effectiveness of 76.9% (95% CI: 45.0–90.3) against RSV-associated severe lower respiratory tract disease requiring

hospitalization in infants from birth to six months, indicating some residual protection beyond the initial six-month period [14]. Efficacy for severe medically-attended RSV-positive LRTI was used as a proxy for vaccine effectiveness against RSV-related hospitalizations, while efficacy against medically-attended RSV-LRTI served as a proxy for vaccine effectiveness in RSV cases managed in the outpatient setting.

Maternal vaccine uptake was assumed to be 20% year-round, due to the lack of country-specific data, and it was assumed to be invariant by the calendar month of expected delivery. The uptake of RSVpreF maternal vaccination was assumed uniformly distributed within the period of 32-36 weeks of gestation as per the Hong Kong regulatory approval for RSVpreF [2].

Utilities and Disutilities

In the absence of robust data, a utility estimate of 1.0 was assumed for infants without RSV. Utility values for persons aged ≥ 1 year were estimated from the published literature, where baseline population utility values for Hong Kong were reported (Supplementary Table 8) [15]. Disutility due to RSV-related hospitalization and outpatient visits was incorporated as QALY loss for infants and for their caregivers and were derived from the published literature (Supplementary Table 9).

Costs

The direct and indirect cost input parameters are summarized in Supplementary Table 10. Hospitalization-specific costs for infants with RSV were calculated by weighted average to account for infants admitted to an intensive care unit (ICU) (1.5% of cases for 3 days [3] at a unit cost of US\$3,575 per day based on Hong Kong Hospital Authority data) [16], and then transferred to the general ward (for the remaining 8.5 days at a unit cost of US\$747 per day) [16], and those infants admitted to only general ward (98.5% of cases for 3 days at a unit cost of US\$747 day based on Hospital Authority data) [16]. Based on this approach, the cost of an RSV episode requiring hospitalization was US\$2,521.41.

The cost of an outpatient episode of RSV was reflective of charges listed by the Hong Kong Hospital Authority (US\$66.71) [16] which did not differentiate by wGA at birth;

therefore, the same cost was assumed for each age group. The cost per dose for maternal RSVpreF vaccination was assumed US\$320.37/dose. The administration cost for maternal vaccination (US\$7.22) was estimated based on a study reporting costs for introducing age/gestation-based universal influenza vaccine schedules for young children and pregnant women in Hong Kong [17].

Indirect costs, consisting of lost productivity, were taken into account in a scenario analysis for societal perspective. The following productivity losses were included in the analysis: (1) work absenteeism of caregivers who provided care to RSV-positive infants, and (2) lost labor opportunities that might have materialized after the maturity of the infants who experienced death due to RSV. Work losses experienced by caregivers were calculated by multiplying the average daily wage and the number of working days missed. The percentage of caregivers with full-time employment (83.1%) was derived from the World Bank [18]. The average daily wage for full-time employed caregivers (US\$88.01) was estimated from Census and Statistics Department data [19].

Analysis

The base case analysis was conducted from the Hong Kong public healthcare system perspective and included intervention and direct medical costs (2025 US\$). Costs for medical care items were obtained from publicly available sources and inflated to 2025 values using the Consumer Price Index data obtained from the Census and Statistics department [20], where necessary. For costs reported in Hong Kong Dollars (HK\$), such as general ward and ICU cost per day, outpatient visit, and average daily wage, the reported dollar amounts were converted to US\$ using the conversion factor of 1 US\$ = 7.8 HK\$ [21], and inflated accordingly if needed. The model was adapted with a 99-year time horizon and a yearly discount rate of 3% for both costs and outcomes. The discount rate derived from a recent systematic review of the economic evaluations of influenza vaccines in the Guangdong-Hong Kong-Macao Greater Bay Area given the lack of a formal HTA guidance in Hong Kong [22]. Additionally, considering there is no specific willingness-to-pay (WTP) threshold in Hong Kong, the base case analysis utilized a 1 x gross domestic product per capita (GDPpc) (US\$56,840) per QALY gained [23].

Sensitivity and Scenario Analyses

One-way sensitivity analysis (OWSA) was performed by varying specific parameters of interest such as disease incidence, general infant mortality rate, case-fatality rate due to RSV, vaccine effectiveness, cost of interventions, direct cost of disease, healthy infant utility and disutility, and caregiver QALY by $\pm 25\%$. Probabilistic sensitivity analysis (PSA) was also conducted by implementing a Monte Carlo simulation of 1,000 iterations, by selecting input parameter values from a specified probability distribution. Alternative scenarios conducted are described in Supplementary Table 11.

Results

Base Case Analysis

Total and incremental benefits and costs are presented in Table 1. The model estimated that implementation of a year-round RSVpreF maternal vaccination program (assuming 20% vaccination uptake) would prevent 10% of hospitalizations ($n = 113$) and 6% of primary care visits ($n = 256$), annually. Furthermore, maternal vaccination would prevent 8% of RSV-related deaths ($n = 1$) per year. In terms of LYs gained, compared to no vaccination, maternal vaccination would result in 38 additional LYs and 40 additional QALYs gained, saving US\$300,000 in direct medical care costs. The incremental cost associated with the RSVpreF maternal vaccination program was US\$1.84 million. From a Hong Kong public healthcare system perspective, maternal vaccination against RSV would be a cost-effective strategy, with an incremental cost-effectiveness ratio (ICER) of US\$45,776 per QALY gained, falling below the WTP threshold equivalent of 1 x GDPpc (US\$56,840) per QALY gained in Hong Kong (Table 1).

One-Way Sensitivity Analysis

The results from the OWSA are displayed in the tornado diagram (Figure 1). The variations to parameters which had the most significant influence on the resulting ICER were the effectiveness of the maternal vaccine, incidence of RSV hospitalization, cost of the maternal vaccine, case-fatality rate due to RSV-related hospitalization, and cost of RSV-associated hospitalization.

Probabilistic Sensitivity Analysis

The PSA of the 1,000 iterations showed that at a WTP of 1 x GDP pc (US\$56,840) per QALY gained, RSVpreF maternal vaccination was cost-effective in 54% of model iterations in comparison to no vaccination (Figure 2).

Scenario Analysis

The results of the various scenario analyses are shown in Table 2. In the scenarios of different maternal vaccine coverage (3.9%; 90%), significant reductions in the use of healthcare resources were estimated under higher vaccine coverage. Reducing vaccination coverage from 20% to 3.9% would prevent only 2% of hospitalizations ($n = 22$) and 1% of outpatient encounters ($n = 50$) in comparison to the 10% and 6% base case analysis reductions (assuming 20% uptake), respectively. Increasing vaccination coverage from 20% to 90% would result in an increase in prevented hospitalizations, avoiding up to 46% of hospital admissions ($n = 510$) and 28% of outpatient encounters ($n = 1,151$). When including indirect costs in the analysis (the societal perspective), maternal vaccination would save US\$380,000 in indirect costs and reduce the ICER to 0.64 x GDPpc. Considering the application of discount rates, when future costs and outcomes were not discounted, the ICER was 0.34 x GDPpc; however, when both costs and outcomes were discounted at 5% annually, the ICER was 1.14 x GDPpc. When assuming a vaccination administration window of 24–36 weeks of gestation (compared to 32–36 weeks in the base case analysis), 67 additional pregnant women would be vaccinated (6,602 versus 6,535), and the ICER decreased to 0.72 x GDPpc. When vaccine effectiveness duration was assumed to protect only up to six months, a decrease in hospital admissions prevented due to maternal vaccination was estimated (9% [$n = 104$] of hospitalizations averted compared to 10% of hospital admissions averted in the base case analysis), and the ICER increased to 0.89 x GDPpc; however, when the duration of protection was assumed to wane linearly from six months to 0% by 12 months, an increase in hospitalizations prevented was estimated (11% [$n = 122$] of hospitalizations averted), and the ICER of RSVpreF decreased to 0.74 x GDPpc. When a lower case fatality rate (0.19 deaths per 100 hospitalizations), based on a 15-year study (1998-2012) conducted at the Prince of Wales Hospital, one of the largest hospitals in the city of Hong Kong [6], was modelled, the ICER of RSVpreF increased to 2.91 x GDPpc.

Discussion

This economic evaluation examined the cost-effectiveness of RSVpreF maternal vaccination for preventing RSV illness among infants in Hong Kong. The results showed that implementing year-round RSVpreF maternal vaccination would significantly reduce the clinical and economic burden of RSV among infants in Hong Kong, and would likely be a cost-effective program in comparison to no intervention from both the healthcare system and societal viewpoints. In all scenario analyses, RSVpreF maternal vaccination remained a cost-effective strategy, except in the higher discount rate scenario (Scenario 5) and in the lower case-fatality rate scenario (Scenario 9). The OWSA indicated that model results were most sensitive to, the effectiveness and cost of the vaccine, the incidence of RSV hospitalizations, and RSV-hospitalization case-fatality rate. In the PSA, maternal RSVpreF vaccination remained cost effective in the majority of simulations when compared to no vaccination.

A recently published cost-effectiveness analysis by Wang et al. also found that maternal RSVpreF vaccination would likely substantially reduce the burden of RSV among infants in Hong Kong compared to no intervention [24]. However, Wang et al. findings on cost-effectiveness differed from those in our analysis, which may be explained by differences in key inputs, such as incidence rates, mortality rates and effectiveness. First, the RSV hospitalization incidence rate applied by Wang et al. was derived from a global systematic literature review of RSV disease burden in high-income countries [1], while in our analysis the RSV-LRTI hospitalization rates are based on a 15-year study (1998–2012) at the Prince of Wales Hospital, one of the largest hospitals in Hong Kong [6]. Second, although both studies sourced the case-fatality rate from the same recent systematic review [12], Wang et al. applied overall mortality rates among children 0-5 years, while our study specifically considered in-hospital mortality rates among infants aged 0-1 year. Given that our analysis applies an in-hospital case-fatality rate specific to hospitalized infants with RSV, whereas the other study uses an overall mortality rate for a broader pediatric population, their approach likely underestimates the true mortality burden in hospitalized infants. Additionally, Wang et al assumed effectiveness against RSV-LRTI hospitalization based on a secondary endpoint of MATISSE for RSV hospitalization not limited to LRTI,

whereas our analysis derived vaccine effectiveness against RSV-LRTI hospitalization from efficacy against severe medically-attended RSV-LRTI, a primary endpoint in MATISSE [13]. Importantly, real-world evidence from Argentina [14] and United Kingdom (UK) [25] on vaccine effectiveness against RSV-associated severe lower respiratory tract disease requiring hospitalization, supports the use of efficacy estimates from MATISSE primary endpoint.

Published cost-effectiveness analyses in other countries also compared RSVpreF maternal vaccination to no intervention, and showed that RSVpreF maternal vaccination led to improved economic and clinical outcomes across various countries, aligning with the findings of this economic evaluation [26, 27]. It is crucial to specify that comparing results between these economic evaluations is challenging due to distinctions in model structures, local contexts, costs of the vaccine, and healthcare systems. A recent study from the UK estimated that vaccinating 60% of pregnant women year-round would result in a 32% reduction in RSV hospitalizations [26]. For comparison, the scenario analysis for Hong Kong incorporating a 90% vaccine uptake projected a 46% decrease in hospitalizations.

This study has several limitations that should be acknowledged. Firstly, the findings may be conservative as they did not account for direct effects on vaccinated pregnant women, indirect (herd) immunity [28], or potential reductions in upper respiratory tract infections, disease transmission, secondary infections, and long-term complications of infant RSV-LRTI. Secondly, adverse events related to the RSVpreF maternal vaccine were not included in the analysis. This decision was based on findings from the “MATISSE trial”, which found no significant safety concerns, with comparable adverse event rates between the vaccine and placebo groups [13]. For instance, preterm birth rates during the 24–36 wGA window were 5.7% (vaccine) versus 4.7% (placebo), and during the 32–36 wGA window, rates were 4.3% versus 3.7%. In particular, regional analyses showed preterm birth rates of 5% in both groups for high-income countries, while Asia-Pacific countries reported rates of 7.8% (vaccine) versus 15.7% (placebo) [29]. Thirdly, due to limitations on the availability of Hong Kong-specific data, the model relied on parameters from other countries and assumptions where needed (e.g. the relative risk of infant mortality and

RSV encounters by age and term status from US data and assumed vaccine uptake in the base case). Fourthly, the economic benefits were likely underestimated as healthcare costs did not include higher expenses associated with preterm infants (<32 weeks) with RSV [7]. In addition, the study did not consider the opportunity cost of hospital admissions averted or the resulting improvement in hospital bed capacity. By reducing RSV-related hospitalizations during peak seasons, the inclusion of a maternal RSV vaccine program could free up critical resources for other medical needs, which is a particularly important factor in resource-limited systems like Hong Kong. Finally, the static model used did not capture potential indirect effects on other demographics, such as older adults or household members living with infants. Further research is needed to comprehensively evaluate both the clinical and economic impacts of RSVpreF maternal vaccination.

Conclusions

The economic evaluation results suggest that a maternal RSVpreF vaccine program would be cost-effective from both the Hong Kong healthcare system and societal perspectives. Maternal RSVpreF vaccination has the potential to prevent a high number of hospitalizations and outpatient visits and would reduce the economic burden associated with RSV among infants in Hong Kong. The public health impact of maternal RSV vaccination (health outcomes benefits preventing hospitalizations and deaths) is highly dependent on uptake rates; thus, a high vaccine uptake will be crucial for the success of this program in reducing the RSV burden among infants in Hong Kong.

Journal Pre-proof

Conflict of Interest

V.W., M.F., A.L., and D.M. are employees of Pfizer and may hold Pfizer stock. R.K. and L.I. are employed by Evidinno Outcomes Research Inc. (Vancouver, BC, Canada), which received funding from Pfizer in connection with the development of this manuscript and study.

Funding Source

This study was sponsored by Pfizer Inc.

Author Contributions

Conceptualization, V.W., M.F., R.K., L.I., A.L. and D.M.; methodology, V.W., M.F., R.K., L.I., A.L. and D.M.; software, V.W., M.F., R.K., L.I., A.L. and D.M.; validation, R.K. and L.I.; formal analysis, R.K. and L.I.; investigation, R.K. and L.I.; resources, V.W., M.F., A.L. and D.M.; data curation, V.W., M.F., R.K., L.I., A.L. and D.M.; writing—original draft preparation, R.K. and L.I.; writing, V.W., M.F., R.K., L.I., A.L. and D.M.; visualization, R.K. and L.I.; supervision, R.K.; project administration, R.K.; funding acquisition, A.L. and D.M. All authors have read and agreed to the published version of the manuscript.

Ethical Approval Statement

This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

References

[1] Li Y, Wang X, Blau DM, Caballero MT, Feikin DR, Gill CJ, et al. Global, regional, and national disease burden estimates of acute lower respiratory infections due to

- respiratory syncytial virus in children younger than 5 years in 2019: a systematic analysis. *Lancet* 2022;399(10340):2047-64. [https://doi.org/10.1016/S0140-6736\(22\)00478-0](https://doi.org/10.1016/S0140-6736(22)00478-0).
- [2] Centre for Health Protection of the Department of Health. Interim Consensus on the Use of Respiratory Syncytial Virus Vaccines in Hong Kong (As of 17 January 2025), https://www.chp.gov.hk/files/pdf/interim_consensus_on_the_use_of_respiratory_syncytial_virus_vaccines_in_hong_kong_jan2025.pdf?f=13; 2025 [accessed 12 February 2025].
- [3] Hon KL, Leung TF, Cheng WY, Ko NM, Tang WK, Wong WW, et al. Respiratory syncytial virus morbidity, premorbid factors, seasonality, and implications for prophylaxis. *J Crit Care* 2012;27(5):464-8. <https://doi.org/10.1016/j.jcrc.2011.12.001>.
- [4] Census and Statistics Department. Table 115-01012 : Number of live births born in Hong Kong to Mainland women, https://www.censtatd.gov.hk/en/web_table.html?id=115-01012; [accessed 30 July 2024].
- [5] W. Robert Johnston. Abortion statistics and other data--Johnston`s Archive, <https://www.johnstonsarchive.net/policy/abortion/ab-hongkong.html>; [accessed 30 July 2024].
- [6] Chan PKS, Tam WWS, Lee TC, Hon KL, Lee N, Chan MCW, et al. Hospitalization Incidence, Mortality, and Seasonality of Common Respiratory Viruses Over a Period of 15 Years in a Developed Subtropical City. *Medicine (Baltimore)* 2015;94(46):e2024. <https://doi.org/10.1097/MD.0000000000002024>
- [7] Tam CC, Yeo KT, Tee N, Lin R, Mak TM, Thoon KC, et al. Burden and Cost of Hospitalization for Respiratory Syncytial Virus in Young Children, Singapore. *Emerg Infect Dis* 2020;26(7):1489-96. <https://doi.org/10.3201/eid2607.190539>.
- [8] Rainisch G, Adhikari B, Meltzer MI, Langley G. Estimating the impact of multiple immunization products on medically-attended respiratory syncytial virus (RSV) infections in infants. *Vaccine* 2020;38(2):251-7. <https://doi.org/10.1016/j.vaccine.2019.10.023>

- [9] Curns AT, Rha B, Lively JY, Sahni LC, Englund JA, Weinberg GA, et al. Hospitalizations associated with respiratory syncytial virus among 627 U.S. children <5 years of age. RSV Symposium 2022. Belfast, Northern Ireland 2022.
- [10] Lively JY, Curns AT, Weinberg GA, Edwards KM, Staat MA, Prill MM, et al. Respiratory Syncytial Virus-Associated Outpatient Visits Among Children Younger Than 24 Months. *J Pediatric Infect Dis Soc* 2019;8(3):284-6.
<https://doi.org/10.1093/jpids/piz011>.
- [11] Census and Statistics Department. Hong Kong Monthly Digest of Statistics: Trends of Infant Mortality in Hong Kong, 1951 to 2021
[/https://www.censtatd.gov.hk/en/data/stat_report/product/B1010002/att/B10100022023MM05B0100.pdf](https://www.censtatd.gov.hk/en/data/stat_report/product/B1010002/att/B10100022023MM05B0100.pdf); 2023 [accessed 1 August 2024].
- [12] Duan Y, Jiang M, Huang Q, Jia M, Yang W, Feng L. Incidence, hospitalization, and mortality in children aged 5 years and younger with respiratory syncytial virus-related diseases: A systematic review and meta-analysis. *Influenza Other Respir Viruses* 2023;17(5):e13145. <https://doi.org/10.1111/irv.13145>.
- [13] Simoes EAF, Pahud BA, Madhi SA, Kampmann B, Shittu E, Radley D, et al. Efficacy, Safety, and Immunogenicity of the MATISSE (Maternal Immunization Study for Safety and Efficacy) Maternal Respiratory Syncytial Virus Prefusion F Protein Vaccine Trial. *Obstet Gynecol* 2025;145(2):157-67.
<https://doi.org/10.1097/AOG.0000000000005816>.
- [14] Perez Marc G, Vizzotti C, Fell DB, Di Nunzio L, Olszewicki S, Mankiewicz SW, et al. Real-world effectiveness of RSVpreF vaccination during pregnancy against RSV-associated lower respiratory tract disease leading to hospitalisation in infants during the 2024 RSV season in Argentina (BERNI study): a multicentre, retrospective, test-negative, case-control study. *Lancet Infect Dis* 2025;25(9):1044-54.
[https://doi.org/10.1016/S1473-3099\(25\)00156-2](https://doi.org/10.1016/S1473-3099(25)00156-2)
- [15] Wong EL, Cheung AW, Wong AY, Xu RH, Ramos-Goni JM, Rivero-Arias O. Normative Profile of Health-Related Quality of Life for Hong Kong General Population Using Preference-Based Instrument EQ-5D-5L. *Value Health* 2019;22(8):916-24.
<https://doi.org/10.1016/j.jval.2019.02.014>.

- [16] Hospital Authority. Fees and Charges, https://www.ha.org.hk/visitor/ha_visitor_index.asp?Content_ID=10045&Lang=ENG&Dimension=100&Parent_ID=10044; [accessed 30 June 2024].
- [17] de Haas TDJ, Yeung KHT, Hutubessy R, van der Putten IM, Nelson EAS. Programme costs for introducing age/gestation-based universal influenza vaccine schedules for young children and pregnant women in Hong Kong. *Vaccine* 2021;39(46):6762-80. <https://doi.org/10.1016/j.vaccine.2021.10.009>.
- [18] World Bank. Part time employment (% of employment), <https://genderdata.worldbank.org/en/indicator/sl-tlf-part-zs>; [accessed 31 July 2024].
- [19] Census and Statistics Department. Wages and Labour Earnings, <https://www.censtatd.gov.hk/en/scode210.html>; [accessed 30 June 2024].
- [20] Census and Statistics Department. Consumer Price Indices (October 2019 – September 2020 = 100) at COICOP division level, https://www.censtatd.gov.hk/en/web_table.html?id=510-60003; [accessed 20 November 2025].
- [21] International Monetary Fund. Exchange Rates (ER), [https://data.imf.org/en/Data-Explorer?datasetUrn=IMF.STA:ER\(4.0.1\);](https://data.imf.org/en/Data-Explorer?datasetUrn=IMF.STA:ER(4.0.1);) 2025 [accessed 20 November 2025].
- [22] Mingzheng H, Yanshang W, Ming W, Wentao L, Dawei Z, Ping H. Systematic review of the economic evaluation of influenza vaccines in the Guangdong-Hong Kong-Macao Greater Bay Area. *China pharmacy* 2023;34(6):699-703. <https://doi.org/10.6039/j.issn.1001-0408.2023.06.11>.
- [23] International Monetary Fund. GDP per capita, current prices, U.S. dollars per capita, <https://www.imf.org/external/datamapper/NGDPDPC@WEO/CHN/HKG/JPN/KOR/SGP/TWN>; 2025 [accessed 20 October 2025].
- [24] Wang Y, Rui M, Wei Q, Leung TF, Leung TY, You JHS. Cost-effectiveness of maternal vaccination against respiratory syncytial virus in Hong Kong: a decision-analytical analysis. *Expert Rev Vaccines* 2025;24(1):1015-23. [10.1080/14760584.2025.2589208](https://doi.org/10.1080/14760584.2025.2589208).
- [25] McLachlan I, Robertson C, Morrison KE, McQueenie R, Hameed SS, Gibbons C, et al. Effectiveness of the maternal RSVpreF vaccine against severe disease in infants in

Scotland, UK: a national, population-based case-control study and cohort analysis.

Lancet Infect Dis 2025;10.1016/S1473-3099(25)00624-3.

[26] Hodgson D, Wilkins N, van Leeuwen E, Watson CH, Crofts J, Flasche S, et al.

Protecting infants against RSV disease: an impact and cost-effectiveness comparison of long-acting monoclonal antibodies and maternal vaccination. Lancet Reg Health Eur 2024;38:100829. <https://doi.org/10.1016/j.lanepe.2023.100829>.

[27] Li X, Hodgson D, Flaig J, Kieffer A, Herring WL, Beyhaghi H, et al. Cost-

Effectiveness of Respiratory Syncytial Virus Preventive Interventions in Children: A Model Comparison Study. Value Health 2023;26(4):508-18.

<https://doi.org/doi.org/10.1016/j.jval.2022.11.014>.

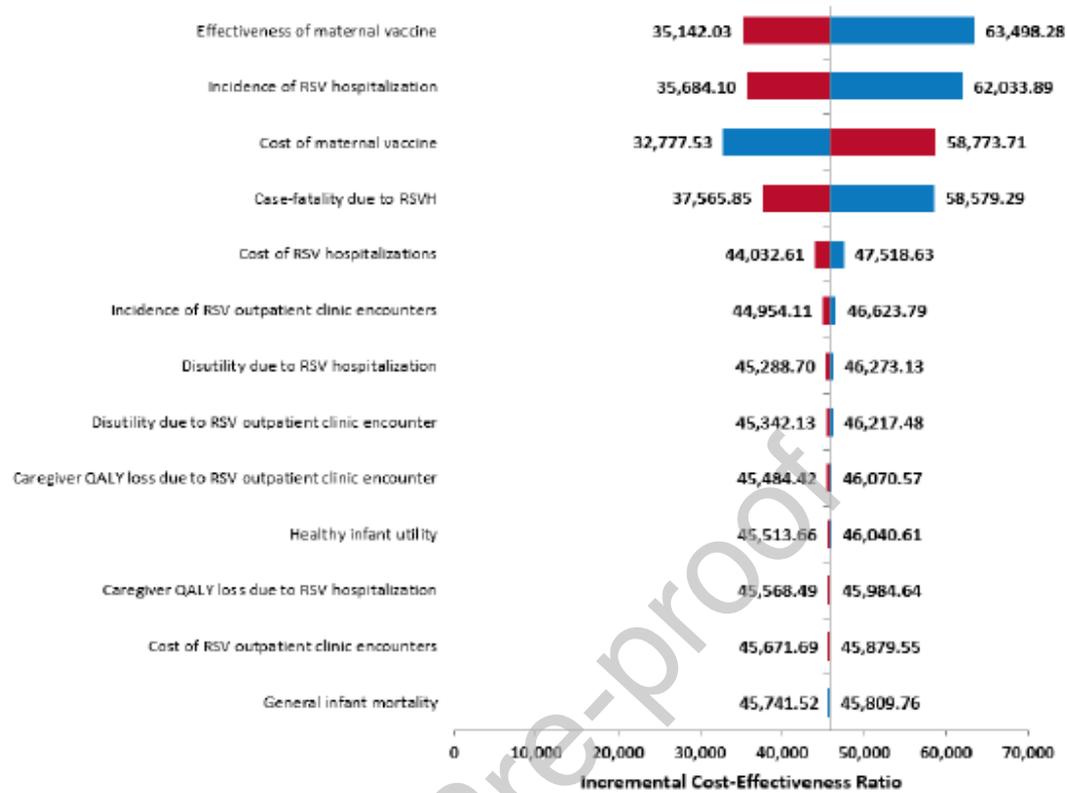
[28] Nazareno AL, Newall AT, Muscatello DJ, Hogan AB, Wood JG. Modelling the epidemiological impact of maternal respiratory syncytial virus (RSV) vaccination in

Australia. Vaccine 2024;42(26):126418. <https://doi.org/10.1016/j.vaccine.2024.126418>.

[29] Madhi SA, Kampmann B, Simoes EAF, Zachariah P, Pahud BA, Radley D, et al.

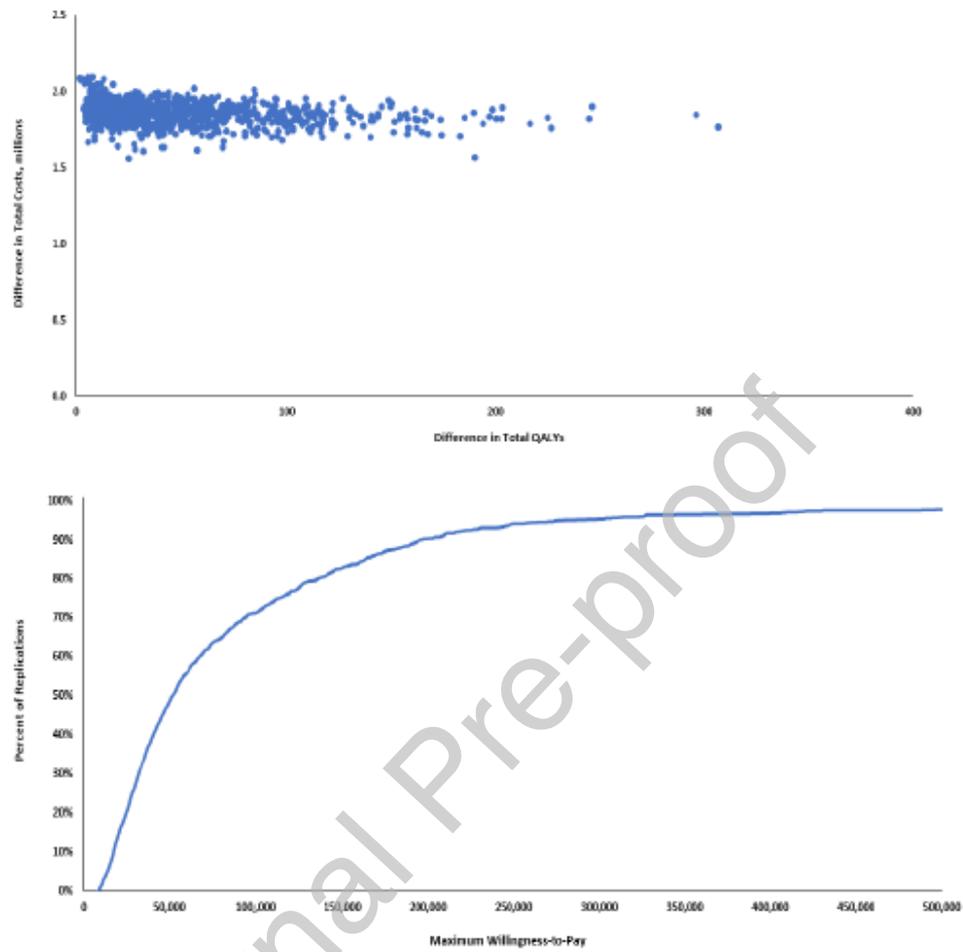
Preterm Birth Frequency and Associated Outcomes From the MATISSE (Maternal Immunization Study for Safety and Efficacy) Maternal Trial of the Bivalent Respiratory Syncytial Virus Prefusion F Protein Vaccine. Obstet Gynecol 2025;145(2):147-56.

<https://doi.org/10.1097/AOG.0000000000005817>.



RSVH = RSV hospitalization.

Figure 1. Tornado diagram for the one-way sensitivity analysis (upper [red] and lower [blue] bounds).



QALYs = quality-adjusted life years.

Figure 2. Probabilistic sensitivity analysis results: (a) cost-effectiveness plane scatterplot; (b) cost-effectiveness acceptability curve.

Table 1: Base case analysis results.

	Maternal vaccine	No intervention	Δ
Clinical outcomes (events)			
RSV hospitalization	995	1,108	-113
RSV outpatient encounter	3,828	4,084	-256
No. of RSV-related deaths	11	12	-1
Life years (discounted)	1,010,574	1,010,536	38
QALYs (discounted)	943,172	943,134	38
Caregivers' QALYs lost (discounted)	22	23	-2
Economic outcomes (US\$M)			
Medical care	2.70	3.00	-0.30
Maternal vaccination	2.14	0	2.14
Total	4.84	3.00	1.84
ICER			
Cost per LY			48,803
Cost per QALY			45,776

ICER = incremental cost-effectiveness ratio, LY = life year, M = million, QALY = quality-adjusted life year, RSV = respiratory syncytial virus.

Table 2: Scenario analysis results: Difference between RSVpreF and no intervention.

Outcomes ^a	Base case	Scenario 1: 3.9% vaccine uptake	Scenario 2: 90% vaccine uptake	Scenario 3: Societal perspective	Scenario 4: 0% discount rate	Scenario 5: 5% discount rate	Scenario 6: Maternal vaccination window 24–36 wGA	Scenario 7: 6-month vaccine effectiveness duration	Scenario 8: 12-month vaccine effectiveness duration	Scenario 9: 0.19% case-fatality rate
Clinical outcomes (events)										
RSV hospitalizations	-113	-22	-510	-113	-113	-113	-127	-104	-122	-113
RSV outpatient encounters	-256	-50	-1,151	-256	-256	-256	-290	-233	-278	-256
No. of RSV-related deaths	-1	0	-6	-1	-1	-1	-1	-1	-1	0
Life years (discounted)	38	7	170	38	98	25	42	35	40	7
QALYs (discounted)	38	7	173	38	94	27	43	35	41	9
Caregivers QALYs lost (discounted)	-2	0	-8	-2	-2	-2	-2	-2	-2	-2
Economic outcomes (US\$M)										
Medical care	-0.30	-0.06	-1.34	-0.30	-0.30	-0.29	-0.33	-0.27	-0.32	-0.30
Maternal vaccination	2.14	0.42	9.62	2.14	2.14	2.14	2.16	2.14	2.14	2.14
Total costs	1.84	0.36	8.28	1.47 ^b	1.84	1.84	1.83	1.87	1.82	1.84
ICER (US\$)										
Cost per LY	48,803	48,803	48,803	38,850	18,745	73,821	43,428	53,991	45,010	282,914
Cost per QALY	45,776	45,776	45,776	36,440	19,247	65,013	40,699	50,654	42,185	165,611

Outcomes^a	Base case	Scenario 1: 3.9% vaccine uptake	Scenario 2: 90% vaccine uptake	Scenario 3: Societal perspective	Scenario 4: 0% discount rate	Scenario 5: 5% discount rate	Scenario 6: Maternal vaccination window 24–36 wGA	Scenario 7: 6-month vaccine effectiveness duration	Scenario 8: 12-month vaccine effectiveness duration	Scenario 9: 0.19% case-fatality rate
% of GDPpc/ QALY gained	80.5	80.5	80.5	64.1	33.9	114.4	71.6	89.1	74.2	291.4

ICER = incremental cost-effectiveness ratio, GDPpc = gross domestic product per capita, LY = life year, M = million, QALY = quality-adjusted life year, wGA = weeks of gestational age.

^a Outcomes results are represented as RSVpreF – no intervention strategy. ^b Indirect cost savings are US\$0.38 million per year.

Declaration of Interest Statement

- The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
- The author is an Editorial Board Member/Editor-in-Chief/Associate Editor/Guest Editor for this journal and was not involved in the editorial review or the decision to publish this article.
- The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

V.W., M.F., A.L., and D.M. are employees of Pfizer and may hold Pfizer stock. R.K. and L.I. are employed by Evidinno Outcomes Research Inc. (Vancouver, BC, Canada), which received funding from Pfizer in connection with the development of this manuscript and study.