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Shifting the COVID-19 Vaccine Landscape with Lower Reactogenicity: Budget Impact of Nuvaxovid© in UK Older Adults

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Key takeaways

In individuals 75+ years, an increased uptake of Nuvaxovid in the seasonal COVID-19 vaccination would bring savings to the UK National Health Service

BACKGROUND

- In the United Kingdom (UK), COVID-19 imposes a significant health and economic burden among vulnerable populations[1]
- In 2025, the Joint Committee on Vaccination and Immunisation (JCVI) recommended targeted seasonal COVID-19 vaccination for adults 75 and older, and those with underlying medical conditions[2]
- Nuvaxovid©, a protein-based COVID-19 vaccine, has demonstrated comparable effectiveness to mRNA-based vaccines while offering a favourable reactogenicity profile[3-4]
- However, the budget impact on the National Health Service (NHS) from broader Nuvaxovid adoption, accounting for its favourable reactogenicity profile, remains unquantified

OBJECTIVE

To estimate the budget impact to the NHS of increased Nuvaxovid uptake versus mRNA-based COVID-19 vaccines (BNT162b2, mRNA-1273) in UK adults aged ≥75 years, and to assess the potential for cost neutrality or savings

METHODS

Model population: UK older adults (≥75 years)

Model structure: We developed a budget impact model (BIM) comparing individuals receiving different COVID-19 vaccines (NVX-CoV2373 [Nuvaxovid], BNT162b2 [Comirnaty], and mRNA-1273 [Spikevax]) and unvaccinated individuals, accounting for reactogenicity and associated healthcare costs **(Figure 1)**

Perspective and Time Horizon: UK payor perspective (NHS) over a five-year time horizon

Key model inputs

- Model inputs were informed by UK-specific demographics, epidemiology, healthcare resource utilisation, and associated costs **(Table 1)**
- Post-vaccination adverse events (AE) by severity (Grade 1–4) and nature (local, systemic) were taken from a head-to-head randomised controlled trial[5]
- Vaccine acquisition costs were informed by a recent UK cost-effectiveness analysis[6]
- All costs are expressed in 2025 British Pound Sterling (GBP £)

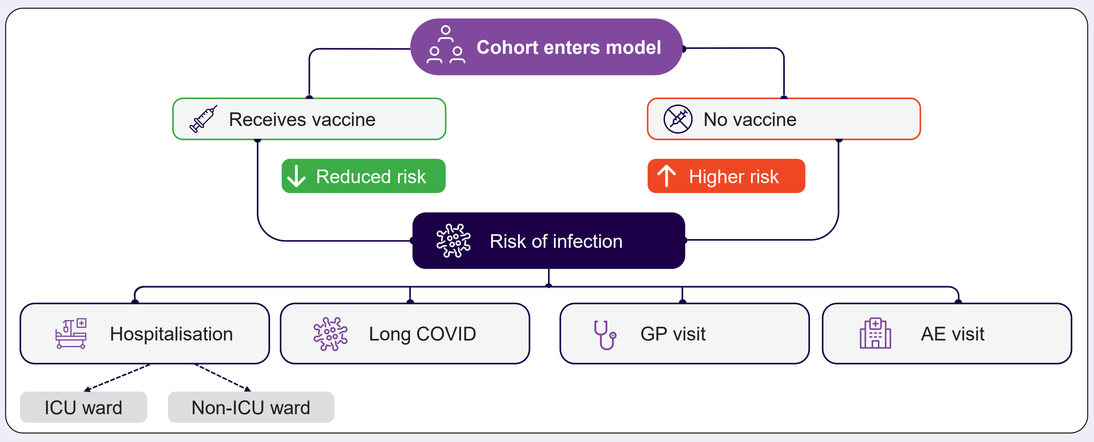
Assumptions

- Across all vaccines modelled, estimates assumed equal vaccine effectiveness (66.5%), similar AE profile for mRNA-based vaccines, a general practitioner (GP) visit for a Grade 3 systemic event, and a constant vaccine coverage rate (VCR) of 68%
- Vaccine administration was modelled as a single seasonal dose per vaccine

Scenarios: Alternative market-share scenarios for a world without vs. a world with Nuvaxovid use (0% vs. 5% in year 1, increasing to 0% vs. 15% by year 5) were tested

Outcomes: Annual and cumulative budget impact for each market-share scenario

Figure 1: Model flow diagram



Abbreviations: AE, Adverse event; COVID-19, Coronavirus disease 2019; ED, Emergency department; GP, General practitioner; ICU, Intensive care unit

Table 1: Key model input

Parameter	Input	Source
Population size (≥75 years)	6,492,255	NHS[7]
Vaccine coverage rate	68.0%	
Probability of healthcare event following symptomatic COVID infection (Vaccinated)*		
Hospitalisation	4.17%	Kohli, M, et al.[8]
ICU stay	9.53%	
Long COVID	3.72%	
Proportion of severe Long COVID	18.75%	
GP visit	15.50%	Sandmann, FG, et al.[9]
Grade 3 systemic AE (Nuvaxovid)	1.7%	Derfalie E, et al.[5]
Grade 3 systemic AE (mRNA vaccine†)	6.0%	
Healthcare resource use costs		
Long covid – mild/moderate*	£71	Kohli, M, et al.[8]
Long covid – severe*	£2,538	NICE[10]
GP visit	£45	PSSRU[11]
ED visit	£273	
Non-critical care hospitalisation	£8,792	Yang J, et al.[12]
ICU hospitalisation	£25,638	
Post-hospitalisation (ICU and non-ICU care)	£432	Pritchard, C. et al.[13]
Cost per adverse event		
Grade 3 systemic AE	£203	NHS[14]

Abbreviations: ED, Emergency department; GP, General practitioner; ICU, Intensive care unit; NHS, National Health Service; NICE, National Institute for Health and Care Excellence; PSSRU, Personal Social Services Research Unit;

Note: it is assumed these costs are incurred by patients during the 1st year they have COVID only (i.e., no costs from 2 years onwards)

*Assumed to be the same across all vaccines modelled

†Assumes all mRNA vaccines have the same rate of Grade 3 systemic AE

RESULTS

- The model estimated that 4.4 million adults aged ≥75 years received a COVID-19 vaccine at a total cost of ~£621.0 million during the 2025 winter season vaccination campaign
- Yearly savings of £1.4 to £4.2 million can be achieved by an increased uptake of Nuvaxovid by 5% and 15%, respectively
- In a 5-year horizon, assuming a progressive 5% uptake of Nuvaxovid to 15%, cumulative savings of £16.2 million are attainable **(Figure 2)**
- Cost differences were mainly driven by reduced Grade 3 systemic AE **(Figure 3)**

Figure 2: Projected Annual and Cumulative NHS Budget Impact from Increased Nuvaxovid Market Share over 5 Years

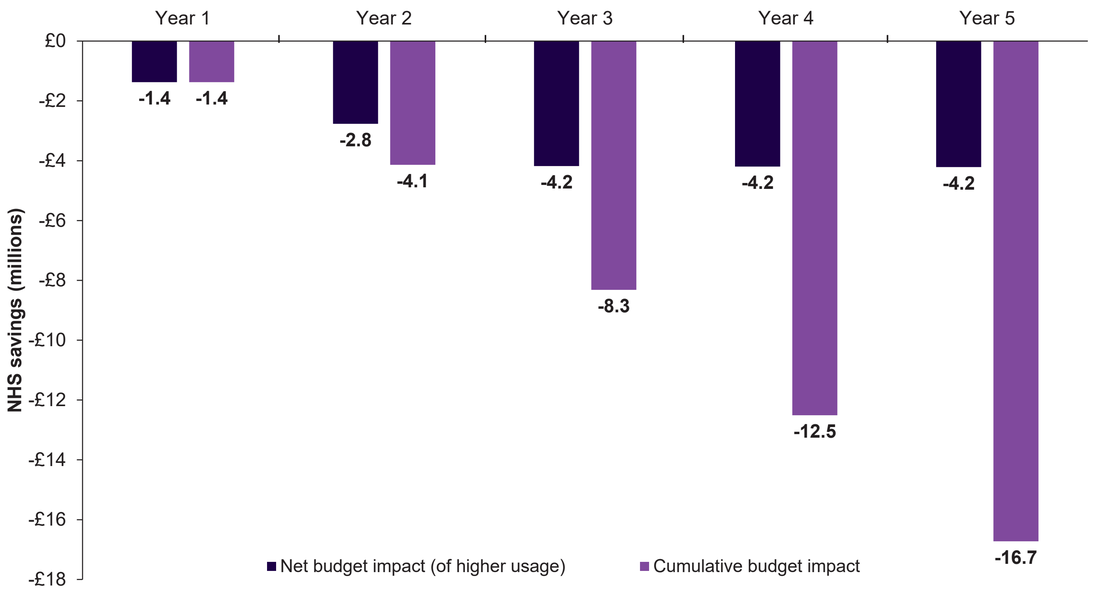
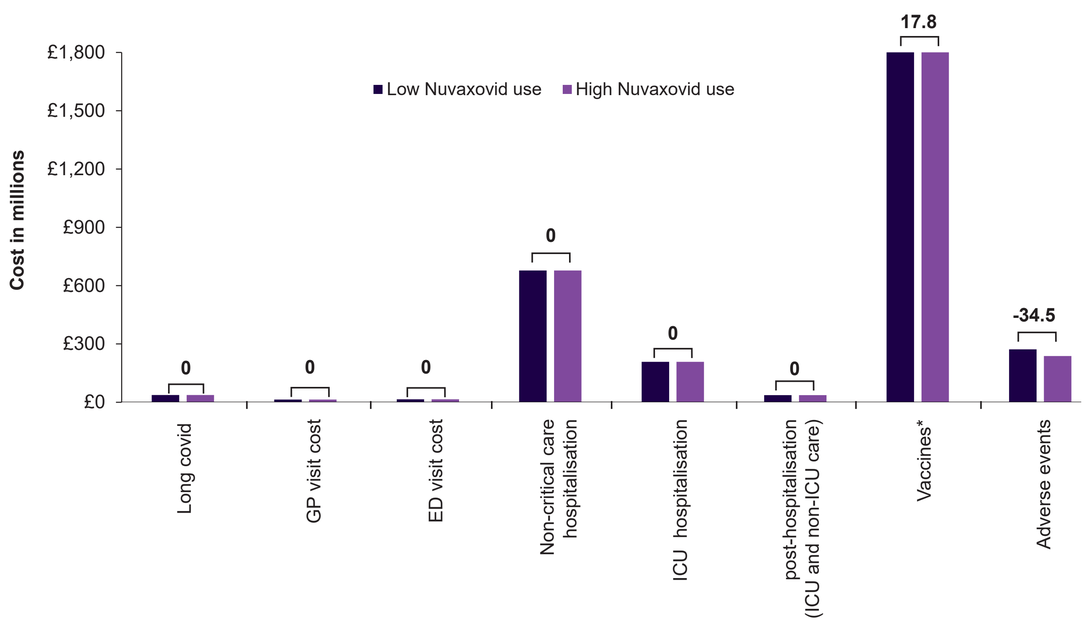


Figure 3: Total Costs by Category: Low (0%) and High (15%) Nuvaxovid Market Share Scenarios



*Includes vaccine acquisition and administration cost

Abbreviations: COVID, Coronavirus disease ED, Emergency department; GP, General practitioner; ICU, Intensive care unit

STRENGTHS & LIMITATIONS

Strengths:

- While previous UK studies have assessed the cost-effectiveness of Nuvaxovid and other COVID-19 vaccines, this research focuses on its payor affordability, considering the most vulnerable of all recommended populations
- Outcomes of this study are informed by recent UK-specific epidemiological and cost data, and account for vaccine reactogenicity, enhancing the precision of budget impact estimates

Limitations:

- The evolving nature of the disease, changes in JCVI vaccine recommendations, and vaccine acquisition rebates warrant caution, as the findings of this study might not be current in future years
- Findings of this study could be strengthened by the inclusion of all JCVI-recommended groups and the addition of a societal perspective that accounts for productivity losses, both those related to the disease and those attributable to vaccine reactogenicity

CONCLUSION

By offering an improved reactogenicity profile compared to mRNA-based COVID-19 vaccines, and assuming roughly similar vaccine acquisition costs, the use of Nuvaxovid can reduce the NHS immunisation budget for COVID-19 while supporting sustained vaccine coverage rates among elderly patients in the UK

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