



The Public Health Impact of mRNA-1273 Fall 2023 Vaccination in the Netherlands

EPH211

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Introduction

The COVID-19 pandemic is officially over, however, as SARS-CoV-2 is expected to continue to cause a high disease burden during the Winter season, public health authorities globally are expected to continue COVID-19 vaccination. Although both mRNA-1273 and BNT162b2 employ the mRNA mode of action, the composition of each vaccine is different with regards to dosage, type of lipid nanoparticles and delivery system.

In the Netherlands, the vaccination campaign will mainly target older adults (≥ 60 years) and certain medical risk groups¹. In the endemic stage, COVID-19 vaccines are expected to be assessed within regular HTA processes. Public health authorities will need to weigh the effectiveness and costs of the available vaccines.

In this study, we quantified the public health impact of a Fall 2023 COVID-19 campaign with the XBB1.5 updated mRNA-1273 vaccine by Moderna vs. no Fall vaccination and vs. the XBB1.5 BNT162b2 vaccine by Pfizer-BioNTech in the Netherlands.

Methods

A decision tree-based budget impact model was developed to estimate the impact of an XBB1.5 updated mRNA-1273 vaccination programme from a healthcare system perspective over one year. Two comparators were considered: no Fall 2023 vaccination or the XBB1.5 BNT162b2 vaccine. Incidence for the Netherlands was estimated from historical COVID-19 data from 2022-2023. Relevant health events included symptomatic COVID-19, hospitalizations, long COVID, and mortality. Recent conservative data from the United Kingdom was used to estimate the comparative effectiveness of the two vaccines². Two potential scenarios were considered: i. vaccinating older adults and people at risk (targeted vaccination campaign, as currently recommended in the Netherlands) ii. vaccinating all adults (universal vaccination, ≥ 18 years).

Model structure



Key input parameters

Parameter	Value (95% confidence interval)	Reference
Vaccination coverage	18-29 years: 0.30%; 30-49 years: 0.40%; 50-59 years: 4.30%; 60-64 years: 49.40%; 65+ years: 72.60%. Risk groups 18-59 years: 27%	3,4
Eligible population	Targeted vaccination campaign: 5,922,719 Universal vaccination campaign: 14,497,316	5
Vaccine effectiveness mRNA-1273	Infection: 67.08% (41.60% - 81.20%); hospitalization: 87.85% (80.30% - 92.10%)	2,6
Hazard ratio (HR) mRNA-1273 vs. BNT162b2	Infection: 0.95 (0.95-0.96); hospitalization: 0.89 (0.82 - 0.95). HR < 1 favours mRNA-1273.	2
Monthly waning rate	Infection: 4.58 ppt; hospitalizations: 3.58 ppt. Assumed to be equal for both vaccines.	6

Results

Public health impact of mRNA-1273 COVID-19 vaccination, considering the targeted Fall 2023 vaccination campaign

Compared to no vaccination.



>248,000
COVID-19 cases



6,363
Hospitalizations



1,388
Deaths

The clinical event costs saved for mRNA-1273 are over: €53 million⁷, compared to no vaccination. The reduction of hospitalizations is a major contributor to these saved costs.

Scenario analysis: results for universal vaccination strategy

Outcome	BNT162b2	mRNA-1273	Difference
Prevented cases of COVID-19	247,762	256,055	-8,293
Prevented COVID-19 hospitalizations	6,100	6,387	-286
Prevented COVID-19 related deaths	1,328	1,390	-62

Based on a total of 3,625,948 vaccinations.

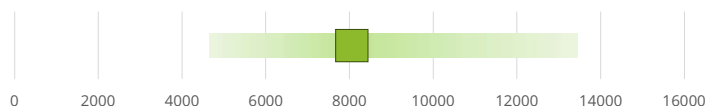
Conclusion

A Fall 2023 adult COVID-19 vaccination campaign, either targeted or universal, results in a substantial public health benefit in the Netherlands, with a notable reduction in cases, hospitalizations, and deaths. mRNA-1273 results in larger reductions in the number of cases, hospitalizations, and deaths, compared to BNT162b2. Future evidence such as updated vaccine effectiveness data or meta-analyses may be used to further assess the benefits of COVID-19 vaccines as the virus continues to evolve.

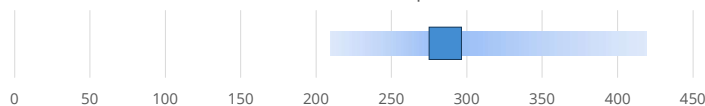
Comparison mRNA-1273 and BNT162b2, targeted Fall 2023 vaccination campaign

Shown are the average prevented clinical events when mRNA-1273 is implemented, compared to BNT162b2 (solid squares), including the 95% confidence intervals (lighter bars), varying the HR.

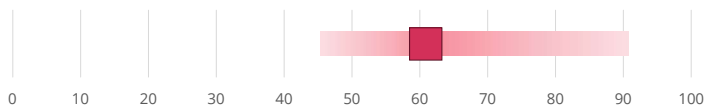
Prevented cases of COVID-19



Prevented COVID-19 hospitalizations



Prevented COVID-19-related deaths



Based on a total of 3,506,562 vaccinations. The clinical event costs saved for mRNA-1273 are: €3 million compared to BNT162b2⁷.

References

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- Clinical effect costs are reported in the supplement, scan the QR code to download this.



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