

Budget Impact Model for the Swiss Healthcare System: Assessing Potential Budget Savings of an Adapted Fall 2023 COVID-19 Vaccination Strategy

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BACKGROUND

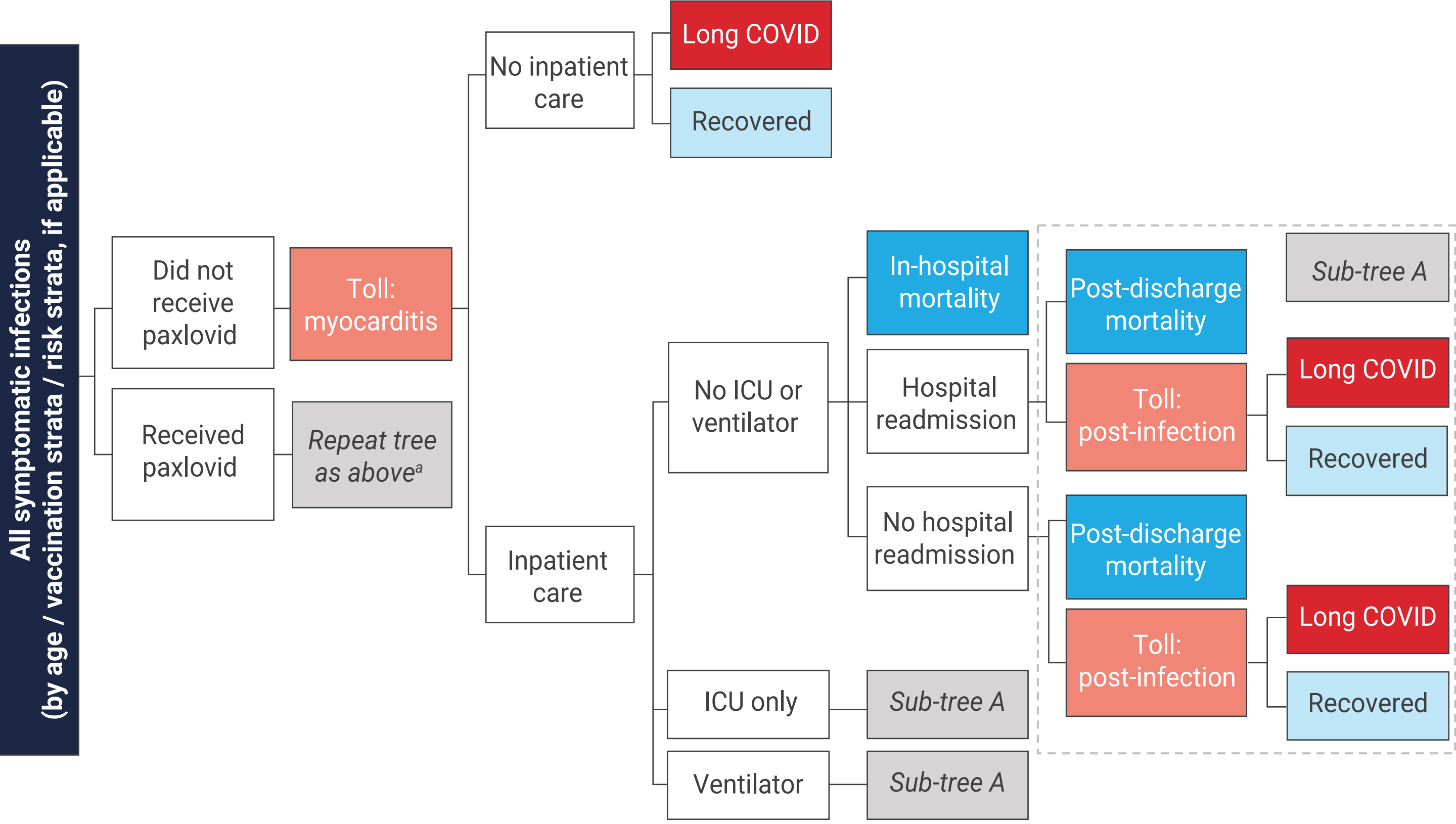
- The COVID-19 pandemic has caused significant challenges to healthcare systems worldwide, including in Switzerland^{1,2}
- Vaccination campaigns have been pivotal in curbing the spread of the disease; adapted booster vaccination strategies have emerged as potentially enhancing protection^{3,4}



METHODS

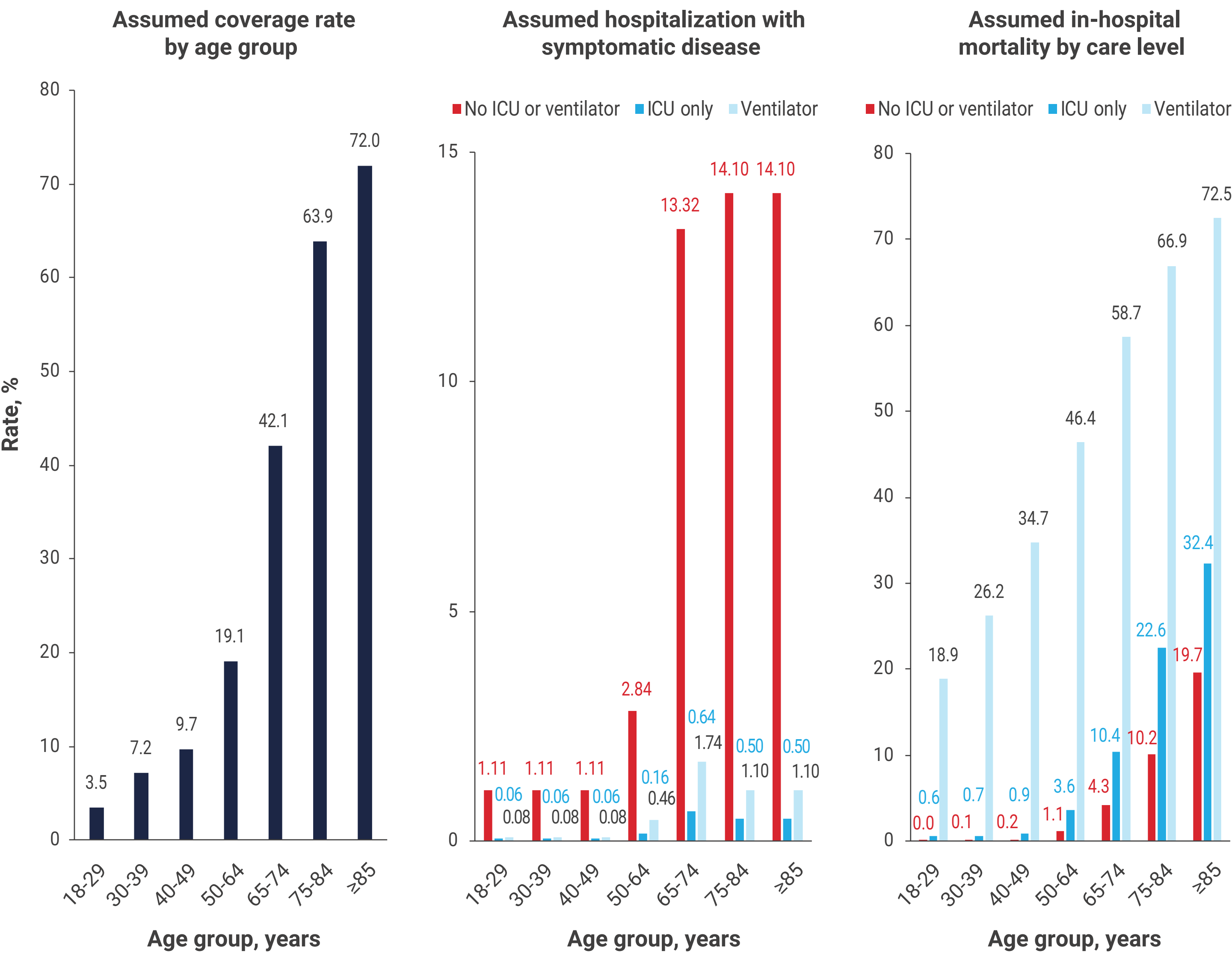
- A budget impact model was developed (**Figure 1**)⁵ to estimate the financial implications of introducing an adapted Moderna mRNA fall 2023 COVID-19 vaccination strategy compared with the absence of such a strategy
- The model incorporated data on clinical vaccine effectiveness, disease burden, healthcare resource utilization, and costs (outpatient, hospitalizations, death, long COVID) (**Figures 2 and 3**)
 - Cost per vaccine dose was assumed to be 80 CHF
- The analysis was conducted from the perspective of the Swiss healthcare system over a 1-year time horizon

Figure 1. Model Diagram: Infection Consequence Decision Tree



*Following all symptomatic infections, there was a risk of myocarditis assumed that varies with age.

Figure 2. Model Assumptions



Vaccination coverage,⁶ hospitalization,⁷ and in-hospital mortality⁷ data from 2022/2023 season as basis. ICU, intensive care unit.



OBJECTIVE

- This study aims to evaluate the budget impact of implementing a fall 2023 COVID-19 vaccination strategy, with an adapted Moderna vaccine for individuals aged ≥65 years and immunocompromised individuals aged ≥18 years in the Swiss healthcare system, and to assess the potential cost savings

Figure 3. Cost Assumptions

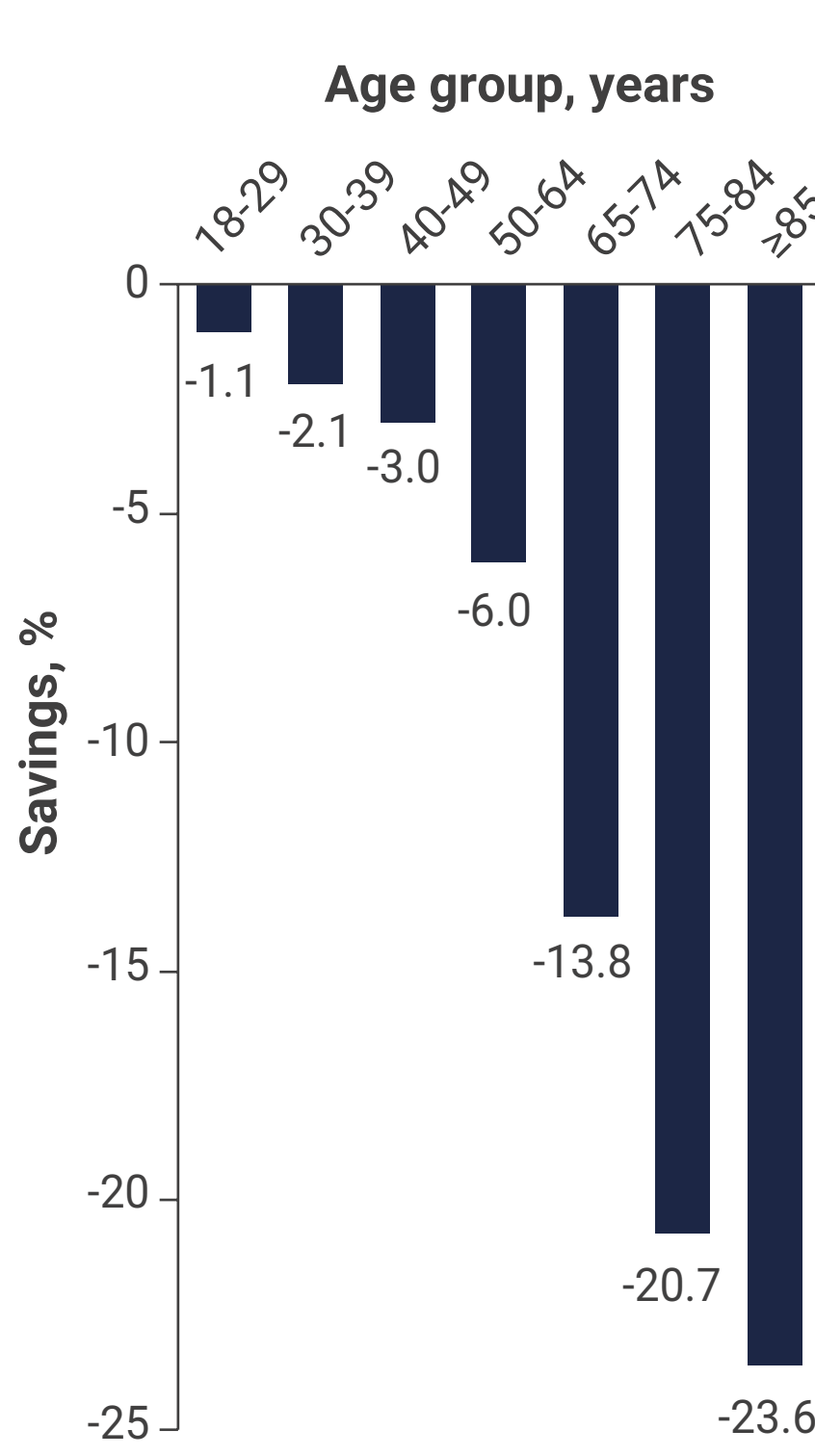
Short-term infection period, not hospitalized	
Proportion not hospitalized who seek outpatient care ^{8,a}	46.2%
Short-term infection outpatient care ^b	
Outpatient only cost (per visit) ⁹	117.97
Number of outpatient-only visits ¹⁰	3.02
Emergency department visit cost (per visit) ⁹	613.05
Number of emergency department visits ¹⁰	0.17
Cost of acute outpatient care	461.00
Short-term infection period, hospitalized	
Location of care ¹⁰	
No ICU or ventilator	15,089
ICU only	27,058
Ventilator	71,367
Hospitalization recovery ^c	
Outpatient only cost (per visit)	117.97
Number of outpatient-only visits ¹¹	3.45
Emergency department visit cost (per visit)	613.05
Number of emergency department visits ¹¹	1.09
Cost of inpatient follow-up (per case)	1077.72

¹⁰Influenza data were used as a proxy due to an absence of COVID-19 data.

¹¹No medical treatment is assumed for those who do not seek outpatient care.

^cApplied to patients that survive the initial hospitalization (ie, does not die due to in-hospital mortality). Patients who are readmitted are assumed to receive the same cost as their initial location of care.

Relative savings per age group



RESULTS

- The budget impact model revealed that a vaccination strategy with an adapted Moderna fall 2023 COVID-19 vaccine versus no vaccination strategy would avoid 65,059 symptomatic infections (**Table 1**)
- Furthermore, 5574 hospitalizations, including 518 intensive care unit cases with necessary ventilation, and 1048 deaths could be prevented
- The overall costs for COVID-19 care could be estimated as CHF 1,264 m without a program and 1,221 m with a vaccination program, a cost reduction by 3.4%
- The main areas of savings were reduced short-term hospitalization costs, with savings of CHF 124 m and total post-infection costs (including long COVID), with savings of CHF 39 m
- The highest savings were shown in the population cohort aged 65 to 74 years

Table 1. Economic Outcomes

Population level results	Current scenario	New scenario	Difference ^a
Vaccination	0	157,242,327	157,242,327
Adverse events	0	8,294,782	8,294,782
Total short-term infection costs	1,963,200,756	1,780,449,510	-182,751,246
Not hospitalized	1,132,076,277	1,087,187,215	-44,889,061
Hospitalized	831,124,479	693,262,295	-137,862,185
Total post-infection costs	266,651,743	245,483,541	-21,168,203
Not hospitalized	251,315,899	232,967,782	-18,348,117
Hospitalized	15,335,844	12,515,759	-2,820,086
Infection-related myocarditis	17,481,011	16,023,898	-1,457,113
Post-infection period: long COVID	233,776,587	223,082,298	-10,694,289
Not hospitalized	226,988,192	217,271,166	-9,717,026
Hospitalized	6,788,395	5,811,132	-977,263
Total	2,481,110,098	2,430,576,356	-50,533,742

Model time horizon: 1 year.

Perspective: societal.

^aDifference is calculated as: New scenario minus Current scenario.



LIMITATIONS

- With the shift from pandemic to endemic, the future incidence of COVID-19 is highly uncertain
- Assumptions around vaccine effectiveness for the monovalent updated mRNA COVID-19 fall 2023 vaccine was based on the fall 2022 bivalent version of the vaccine



CONCLUSIONS

- Vaccinating the Swiss population aged ≥65 years and immunocompromised individuals aged ≥18 years with the fall 2023 COVID-19 Moderna vaccine versus no vaccination campaign will prevent hospitalizations, intensive care unit stays, long COVID, and deaths, as well as associated treatment costs
- The overall healthcare budget spending can be reduced by such a vaccination strategy

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Acknowledgments

Medical writing and editorial assistance were provided by Renee Gordon, PhD, of MEDISTRAVA in accordance with Good Publication Practice (GPP 2022) guidelines, funded by Moderna, Inc., and under the direction of the authors. This study was funded by Moderna, Inc.

Disclosures

TC, KJ, and EB are employees of Moderna, Inc., and hold stock/stock options in the company. SW is a consultant at Moderna Switzerland GmbH.



ADDITIONAL INFORMATION

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