



Budget Impact Analysis of COVID-19 Vaccines on U.S. Medicare and Commercial Health Plans after Depletion of the Federally-Purchased Supply



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Conflict-of-interest Statement.

All authors declare that they have no conflicts of interest

Agenda.

Background Information

Objectives

Methods

Results

Discussion

Conclusion

Background Information

Budget Impact Analysis of COVID-19 Vaccines



Background Information



Over \$30 billion has been spent on Covid-19 vaccines by Federal government¹



Federally-purchased supply for Covid-19 vaccines will be depleted²



Manufacturers are expected to distribute vaccines at higher prices upon vaccines commercialization¹



Health plans will have to bear most of the Covid-19 vaccines cost²



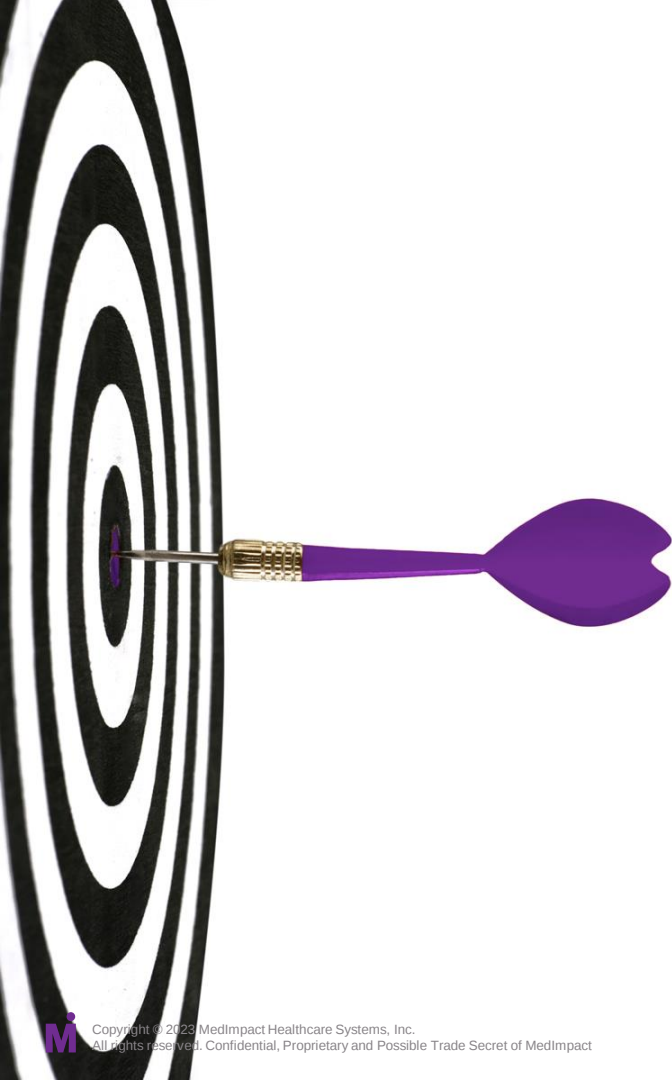
The budget impact of Covid-19 vaccines after its commercialization on health plans has not yet well investigated

1. Mason, J, Taylor, M., & Renshaw, J. (2022). Biden Admin Seeks \$30 Bln More from Congress to Fight COVID –Sources. Reuters. Retrieved March 20, 2023, from <https://www.reuters.com/world/us/biden-administration-seeks-30-bln-more-congress-fight-covid-19-sources-2022-02-15/>
2. Kates, J., Cox, C., Cubanski, J., Tolbert, J., & Pollitz K. (2023). Commercialization of COVID-19 Vaccines, Treatments, and Tests: Implications for Access and Coverage. KFF. Retrieved March 20, 2023, from <https://www.kff.org/coronavirus-covid-19/issue-brief/commercialization-of-covid-19-vaccines-treatments-and-tests-implications-for-access-and-coverage/z>

Objectives

Budget Impact Analysis of COVID-19 Vaccines





BUDGET IMPACT ANALYSIS OF COVID-19 VACCINES

Objectives

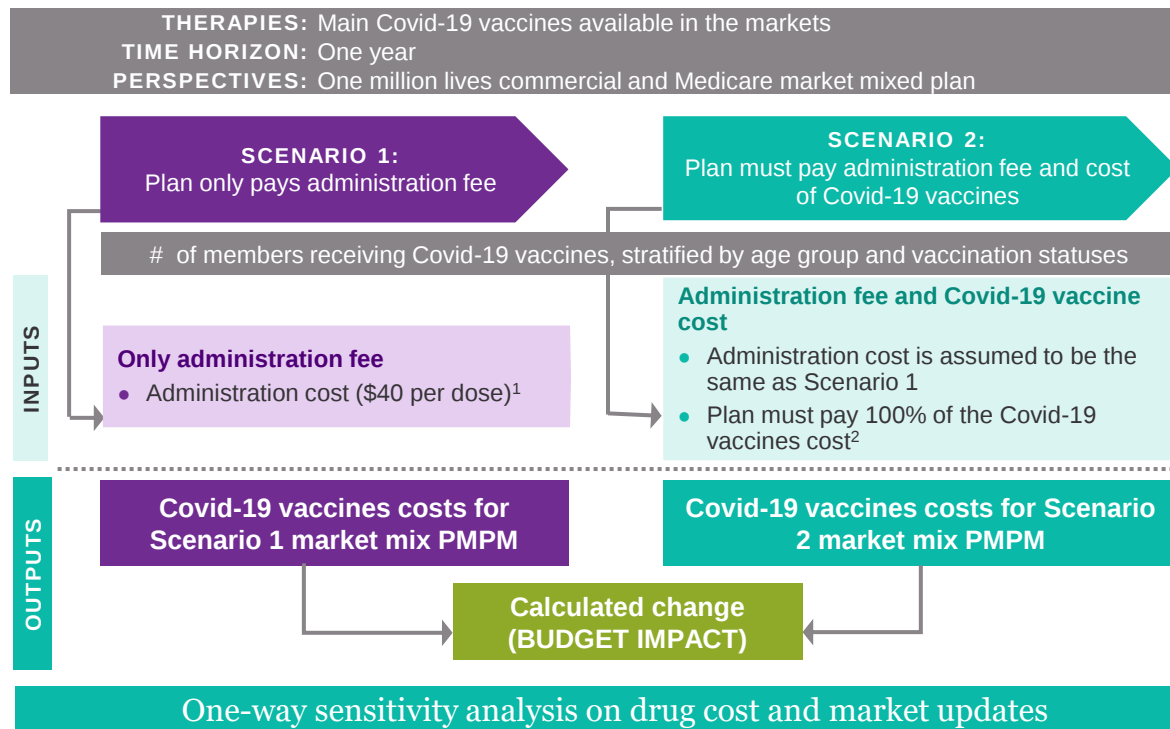
To analyze the budget impact of Covid-19 vaccines from a mixed U.S commercial and Medicare payer perspective after depletion of the Federally-Purchased Supply.

Methods

Budget Impact Analysis of COVID-19 Vaccines

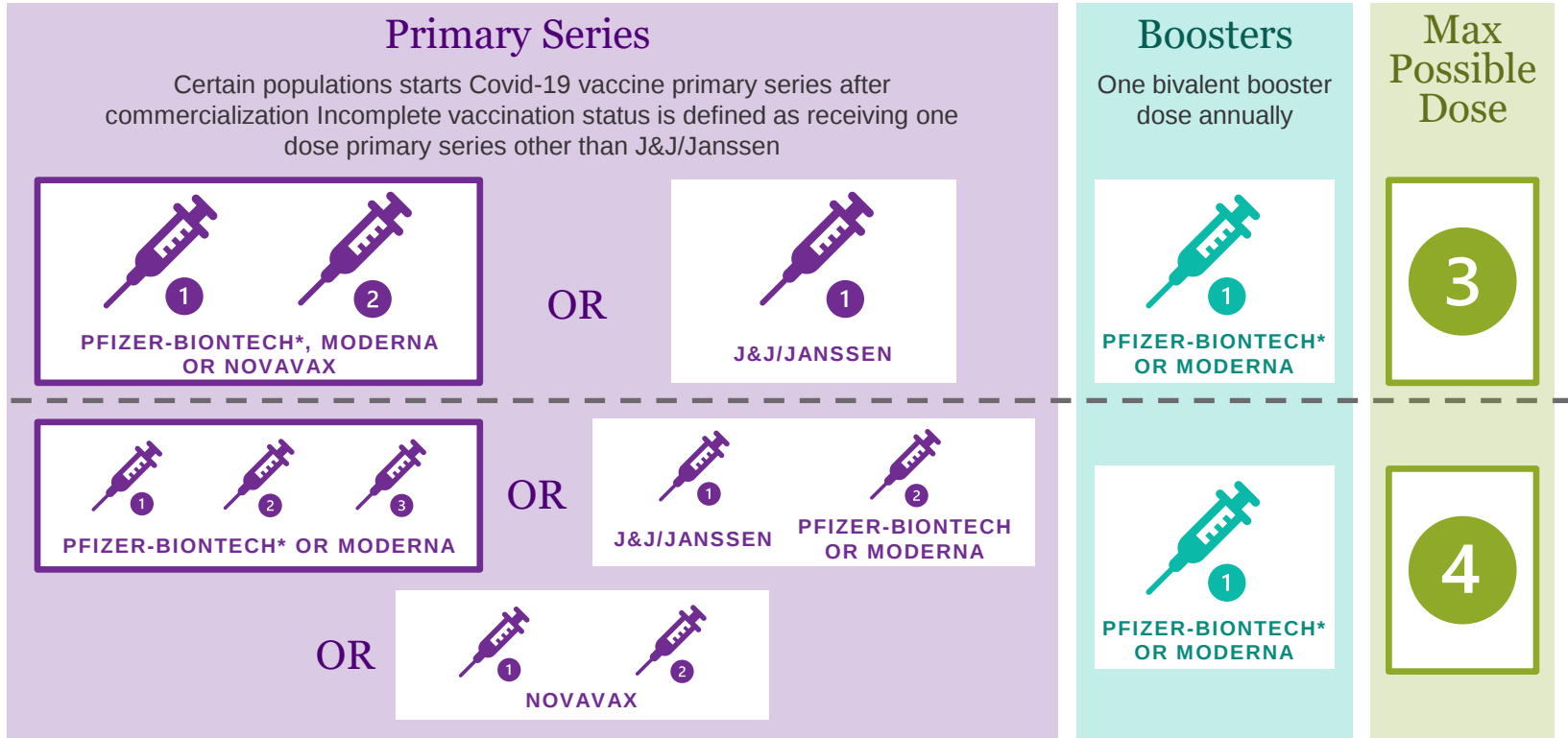


Budget Impact Model Flow



1. Kates, J., Cox, C., & Michaud, J. (2023). How Much Could COVID-19 Vaccines Cost the U.S. After Commercialization? KFF. Retrieved March 20, 2023, from <https://www.kff.org/coronavirus-covid-19/issue-brief/how-much-could-covid-19-vaccines-cost-the-u-s-after-commercialization/#footnote-573802-1>
2. Kates, J., Cox, C., Cubanski, J., Tolbert, J., & Pollitz K. (2023). Commercialization of COVID-19 Vaccines, Treatments, and Tests: Implications for Access and Coverage. KFF. Retrieved March 20, 2023, from <https://www.kff.org/coronavirus-covid-19/issue-brief/commercialization-of-covid-19-vaccines-treatments-and-tests-implications-for-access-and-coverage/>

Covid-19 Vaccinations Schedule Assumptions¹



* Assumed that all 6 months to 4 years old receiving Pfizer-BioNTech vaccines only receive 2 doses in primary vaccines and one bivalent booster

1. Centers for Disease Control and Prevention. (2023). *Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Approved or Authorized in the United States*. Centers for Disease Control and Prevention. Retrieved March 27, 2023, from <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#covid-vaccines>

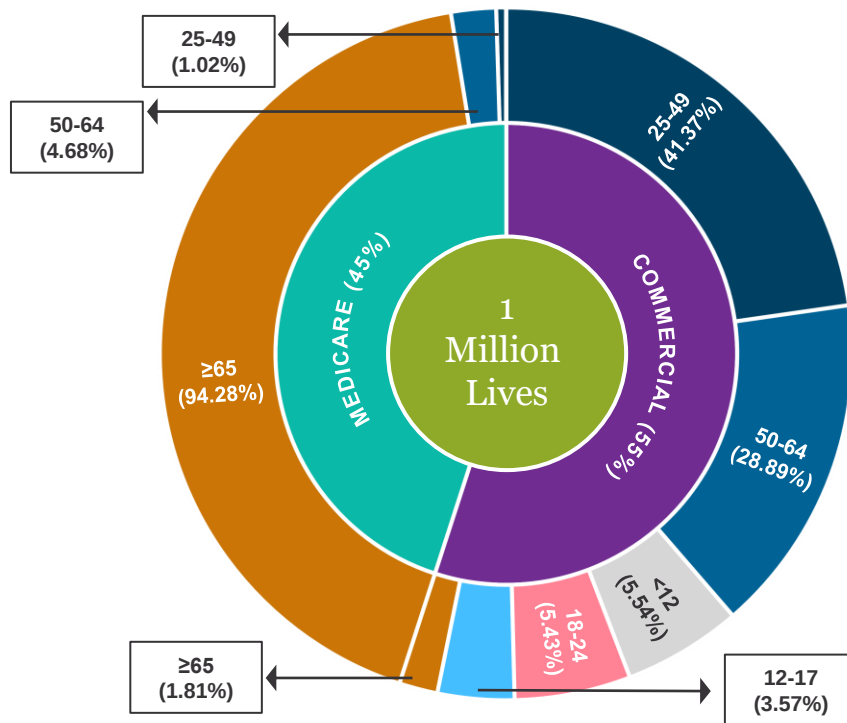
Population Age Stratification Assumptions

	COMMERCIAL POPULATION	MEDICARE POPULATION
Lives count (n, [%]) ^{1, 2}	550,000 (55%)	450,000 (45%)
<12 years old (n, [%]) ¹	55,440 (10.08%)	0 (0.00%)
12-17 years old (n, [%]) ¹	35,695 (6.49%)	0 (0.00%)
18 – 24 years old (n, [%]) ¹	54,340 (9.88%)	90 (0.02%)
25 – 49 years old (n, [%]) ¹	227,535 (41.37%)	4,590 (1.02%)
50 – 64 years old (n, [%]) ¹	158,895 (28.89%)	21,060 (4.68%)
≥ 65 years old (n, [%]) ¹	18,095 (3.29%)	424,260 (94.28%)

1. Assumptions based on experts' recommendations and unpublished real-world data (2023)

2. Grewal, S., Ramsey, S., Balu, S., & Carlson, J. J. (2018). *Cost-savings for biosimilars in the United States: a theoretical framework and budget impact case study application using filgrastim*. Expert Review of Pharmacoeconomics & Outcomes Research, 18(4): 447-454.

Population Age Stratification Assumptions^{1,2}



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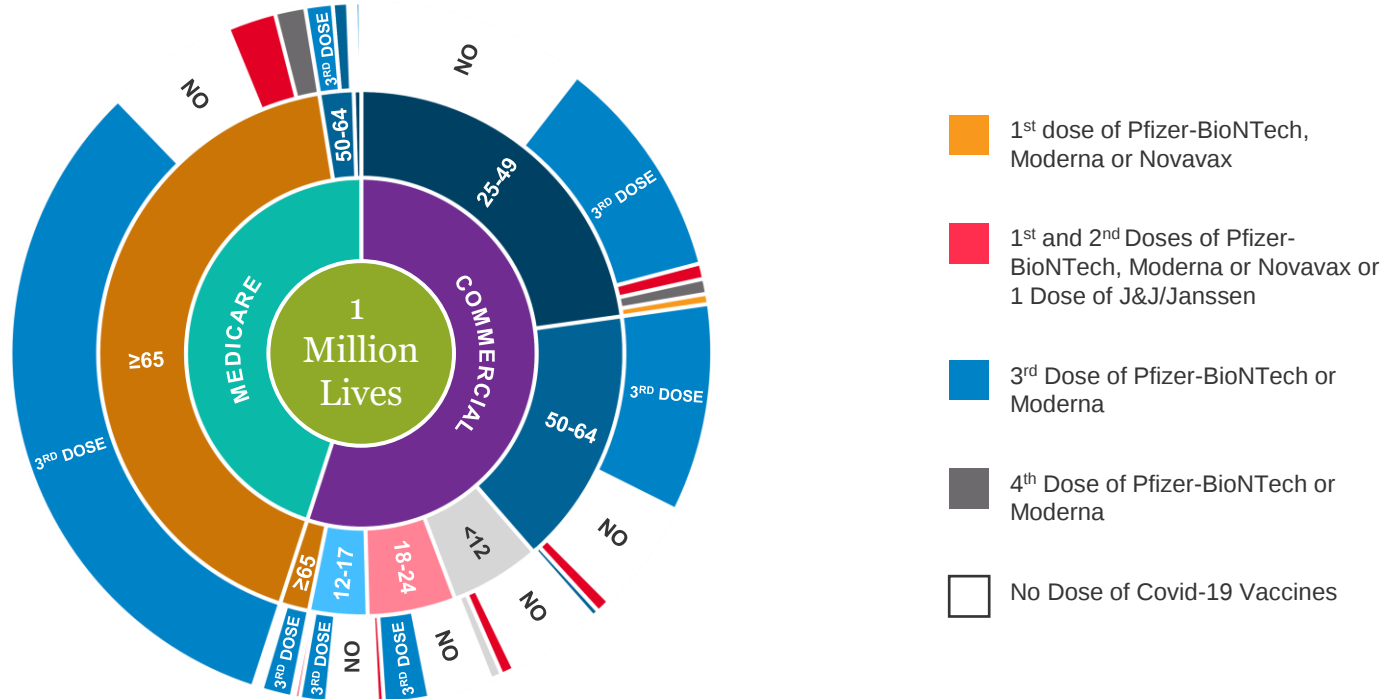
Covid-19 Vaccines Utilization Stratified by Age Group Assumptions^{1*}

	1 ST DOSE OF PFIZER-BIONTECH, MODERNA OR NOVAVAX	1 ST AND 2 ND DOSES OF PFIZER-BIONTECH, MODERNA OR NOVAVAX OR 1 DOSE OF J&J/JANSSEN	3 RD DOSE OF PFIZER-BIONTECH OR MODERNA	4 TH DOSE OF PFIZER-BIONTECH OR MODERNA
<12 years old	0.90%	11.10%	9.60%	3.00% ²
12-17 years old	1.30%	6.20%	35.01%	3.00% ²
18 – 24 years old	3.30%	5.70%	38.33%	3.00% ²
25 – 49 years old	2.10%	3.20%	45.42%	3.00% ²
50 – 64 years old	0.90%	4.10%	60.43%	2.02%
≥ 65 years old	0.00%	5.30%	77.33%	3.26%

* Trend prediction was predicted based on the Covid-19 vaccines utilization trend of available data in 2022

- Centers for Disease Control and Prevention. (2023). Covid-19 Vaccination Demographics in the United States, National. Centers for Disease Control and Prevention. Retrieved January 6, 2023, from <https://data.cdc.gov/Vaccinations/COVID-19-Vaccination-Demographics-in-the-United-St/km4m-vcsb/data>
- The National Institutes of Health. (2023). Special Considerations in People Who Are Immunocompromised. NIH. Retrieved January 6, 2023, from <https://www.covid19treatmentguidelines.nih.gov/special-populations/immunocompromised/> Z

Covid-19 Vaccines Utilization Stratified by Age Group Assumptions^{1,2*}



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- Centers for Disease Control and Prevention. (2023). *Covid-19 Vaccination Demographics in the United States, National*. Centers for Disease Control and Prevention. Retrieved January 6, 2023, from <https://data.cdc.gov/Vaccinations/COVID-19-Vaccination-Demographics-in-the-United-States-national-vcsb/data>
- The National Institutes of Health. (2023). *Special Considerations in People Who Are Immunocompromised*. NIH. Retrieved January 6, 2023, from <https://www.covid19treatmentguidelines.nih.gov/special-populations/immunocompromised/>

Covid-19 Vaccines Market Shares and Cost

	PFIZER-BIONTECH	MODERNA	J&J/JANSSEN	NOVAVAX
Cost per Dose	\$120 ¹	\$120 ²	\$64 ^{3*}	\$64 ^{3*}
Market share for 1 st dose of Pfizer-BioNTech, Moderna or Novavax ^{4,5}	61% [§]	39% [§]	0%	0.00815%
Market share for 1 st and 2 nd Doses of Pfizer-BioNTech, Moderna or Novavax OR 1 Dose of J&J/Janssen ^{*5}	58% [§]	35% [§]	8% [§]	0.0034%
Market share for 3 rd dose of Pfizer-BioNTech or Moderna ⁴	64%	36%	0%	0%
Market share for 4 th dose of Pfizer-BioNTech or Moderna ⁴	64%	36%	0%	0%

* Values were assumed based on the lowest possible cost of Moderna. No available information regarding the actual cost for J&J/Janssen and Novavax. To be adjusted once data is available § Values were rounded

1. Erman, M. (2022). Pfizer Says COVID-19 vaccine Will Cost \$110-\$130 Per Dose. Reuters. Retrieved November 02, 2022, from <https://www.reuters.com/business/healthcare-pharmaceuticals/pfizer-expects-price-covid-vaccine-110-130-per-dose-2022-10-20/>
2. Loftus, P. (2023). Moderna Considers Price of \$110-\$130 for Covid-19 Vaccine. The Wall Street Journal. Retrieved January 10, 2023, from <https://www.wsj.com/articles/moderna-considers-price-of-110-130-for-covid-19-vaccine-11673289609>
3. Kansteinder, F. (2022). Moderna Sizes up Private COVID Vaccine Market in US, Where Shots Could Cost \$100 a Pop. Fierce Pharma. Retrieved November, 11 2022, from <https://www.fiercepharma.com/pharma/moderna-sizes-13b-covid-market-us-where-shots-could-cost-100-pop>
4. Centers for Disease Control and Prevention. (2023). Covid-19 Vaccinations in The United States. Centers for Disease Control and Prevention. Retrieved January 6, 2023, from https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-booster-percent-pop5
5. Centers for Disease Control and Prevention. (2023). COVID-19 Vaccinations in the United States, Jurisdiction. Centers for Disease Control and Prevention. Retrieved January 6, 2023, from <https://data.cdc.gov/Vaccinations/COVID-19-Vaccinations-in-the-United-States-Jurisdiction/unsk-b7fc>

Covid-19 Vaccines Cost Sources



REUTERS® World ▾ Business ▾ Legal ▾ Markets ▾ Breakingviews Technology ▾ Investigations

Healthcare & Pharmaceuticals

2 minute read · October 20, 2022 11:11 PM PDT · Last Updated 5 months ago

Pfizer expects to hike U.S. COVID vaccine price to \$110-\$130 per dose

By Michael Erman

1

The biotech also laid out scenarios based on COVID shot prices at \$82 and \$64, which would unlock potential U.S. private markets worth about \$10.6 billion and \$8.3 billion, respectively.

Looking at just the high-risk population in the U.S., which Moderna figures stands at around 82 million people, a \$100 vaccine price tag could yield collective sales of \$8.2 billion.

3

◆ WSJ NEWS EXCLUSIVE | HEALTH

Moderna Considers Price of \$110-\$130 for Covid-19 Vaccine

Commercial price is similar to Pfizer's plans for after government contracting ends

2

1. Erman, M. (2022). Pfizer Says COVID-19 vaccine Will Cost \$110-\$130 Per Dose. Reuters. Retrieved November 02, 2022, from <https://www.reuters.com/business/healthcare-pharmaceuticals/pfizer-expects-price-covid-vaccine-110-130-per-dose-2022-10-20/>
2. Loftus, P. (2023). Moderna Considers Price of \$110-\$130 for Covid-19 Vaccine. The Wall Street Journal. Retrieved January 10, 2023, from <https://www.wsj.com/articles/moderna-considers-price-of-110-130-for-covid-19-vaccine-11673289609>
3. Kansteinder, F. (2022). Moderna Sizes up Private COVID Vaccine Market in US, Where Shots Could Cost \$100 a Pop. Fierce Pharma. Retrieved November, 11 2022, from <https://www.fiercepharma.com/pharma/moderna-sizes-13b-covid-market-us-where-shots-could-cost-100-pop>

Variables and Range for Sensitivity Analysis

VARIABLES	INPUT	SENSITIVITY ANALYSIS RANGE
Commercial cohort population (n)	550,000	440,000 – 660,000*
Medicare cohort population (n)	450,000	360,000 – 540,000**
% 12-17 years old with 3 rd dose (%)	35.01%	25.01% - 45.01%§
% 18-24 years old with 3 rd dose (%)	38.33%	28.33% - 48.33%§
% 25-49 years old with 3 rd dose (%)	45.42%	25.42% - 65.42%†
% 50-64 years old with 3 rd dose (%)	60.43%	40.43% - 80.43%†
% ≥ 65 years old with 3 rd dose (%)	77.33%	57.33% - 97.33%†
Number of Pfizer-BioNTech and Moderna dose that unvaccinated population is recommended (n)	2	1
Cost 1 dose of Pfizer-BioNtech (\$)	\$120.00	\$110.00 - \$130.00†
Cost 1 dose of Moderna (\$)	\$120.00	\$110.00 - \$130.00†

*The values are ± 10% of the membership counts of the hypothetical commercial plan

**The values are ± 20% of the membership counts of hypothetical Medicare plan

§ ± 10%

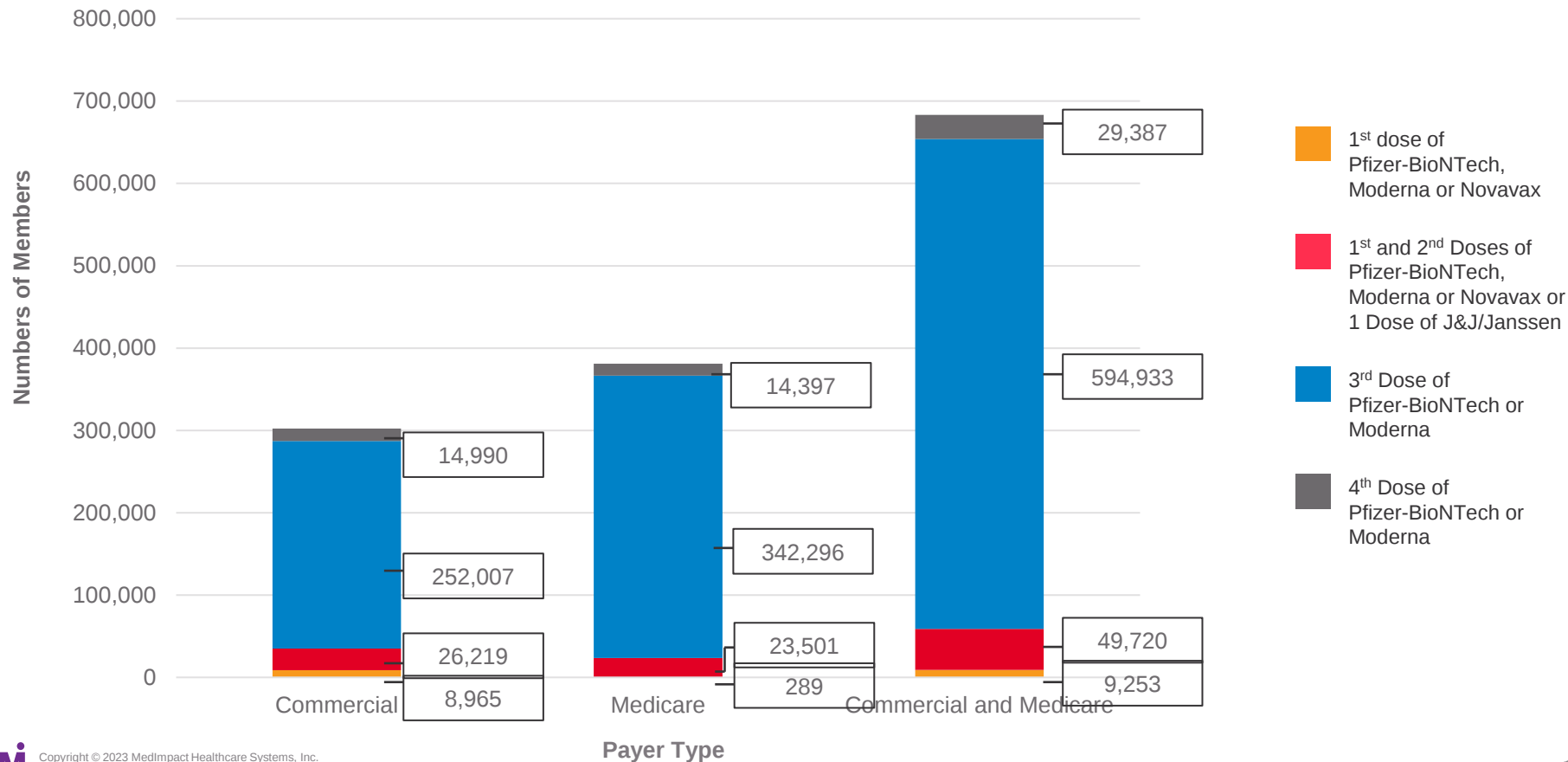
† ± 20%

Results

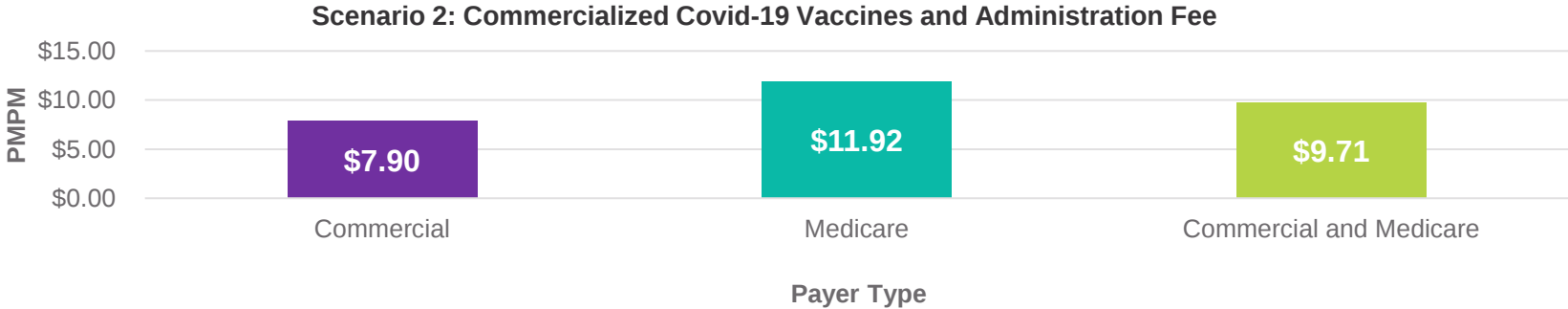
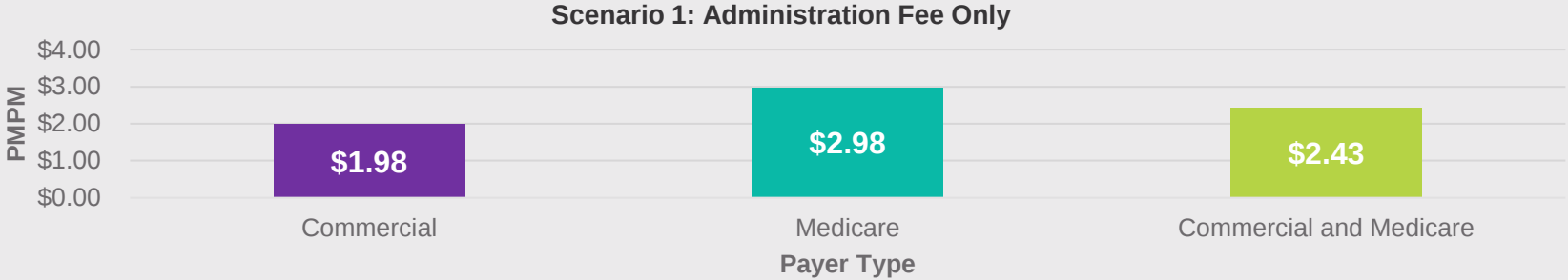
Budget Impact Analysis of COVID-19 Vaccines



Numbers of Members with Covid-19 Vaccines



Scenario 1 vs Scenario 2



The budget impact model only accounts for vaccines and administration cost. Other associated costs such as medical treatment and outcomes were not accounted in the model

Projected Budget Impact of Commercialized Covid-19 Vaccines



The budget impact model only accounts for vaccines and administration cost. Other associated costs such as medical treatment and outcomes were not accounted in the model

Sensitivity and Scenario Analyses Results (\$PMPM)

MODEL INPUTS	COMMERCIAL	MEDICARE	COMMERCIAL AND MEDICARE
Base Case	\$5.92	\$8.93	\$7.27
Commercial cohort population	\$5.92	\$8.93	\$7.61-\$6.94
Medicare cohort population	\$5.92	\$8.23	\$7.00-\$7.55
% 12-17 years old with 3 rd dose	\$5.85 - \$5.98	\$8.93	\$7.24 - \$7.31
% 18-24 years old with 3 rd dose	\$5.82 - \$6.02	\$8.93	\$7.22 - \$7.33
% 25-49 years old with 3 rd dose	\$5.09 - \$6.75	\$8.91 - \$8.95	\$6.81 - \$7.74
% 50-64 years old with 3 rd dose	\$5.34 - \$6.50	\$8.84 - \$9.03	\$6.91 - \$7.63
% ≥ 65 years old with 3 rd dose	\$5.85 - \$5.98	\$7.05 - \$10.82	\$6.39 - \$8.16
Number of Pfizer-BioNTech and Moderna dose that unvaccinated population is recommended	\$5.48	\$8.45	\$6.82
Cost 1 dose of Pfizer-BioNtech	\$5.61 - \$6.23	\$8.46 - \$9.40	\$6.89 - \$7.66
Cost 1 dose of Moderna	\$5.74 - \$6.10	\$8.66 - \$9.20	\$7.05 - \$7.50

The budget impact model only accounts for vaccines and administration cost. Other associated costs such as medical treatment and outcomes were not accounted in the model

Economic Summary

THE ANTICIPATED BUDGET IMPACT OF

Covid-19 Vaccines

For a hypothetical one-million-member health plan with a mixed commercial and Medicare population in one-year period after the depletion of the Federally-Purchased Supply

~\$5.92 PMPM
for Commercial

~\$8.93 PMPM
for Medicare

~\$7.27 PMPM
for Commercial and
Medicare Combination

The budget impact model only accounts for vaccines and administration cost. Other associated costs such as medical treatment and outcomes were not accounted in the model

Discussion

Budget Impact Analysis of COVID-19 Vaccines



Discussion



Covid-19 vaccines have a high budget impact on payers



Cost may become a barrier in uninsured and underinsured population after vaccines commercialization



Covid-19 vaccination is likely to be cost-effective compared to not vaccinating, given its hospitalizations and death preventions, especially in elderly population



Payers should start considering budgeting strategies to mitigate Covid-19 vaccines costs

Strengths and Limitations



Strengths



Utilize real world evidence and publicly available data



Follow most updated guidelines from the CDC



Take in considerations of all eligible population



Limitations



Did not include related medical cost or treatment cost of Covid-19



Did not include potential cost savings in hospitalizations and deaths prevention of Covid-19 vaccines



Ongoing changes for vaccine costs and vaccine schedule guidelines

Conclusions

Budget Impact Analysis of COVID-19 Vaccines



Conclusions



The commercialization of Covid-19 vaccines will have high budget impact on mixed U.S commercial and Medicare health plans



The utilization of Covid-19 vaccines in the population of 65 years and older has the highest impact on the model



Further studies evaluating medical costs and outcomes will be needed to determine cost-effectiveness of Covid-19 vaccines after commercialization

Thank you.

Q&A



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