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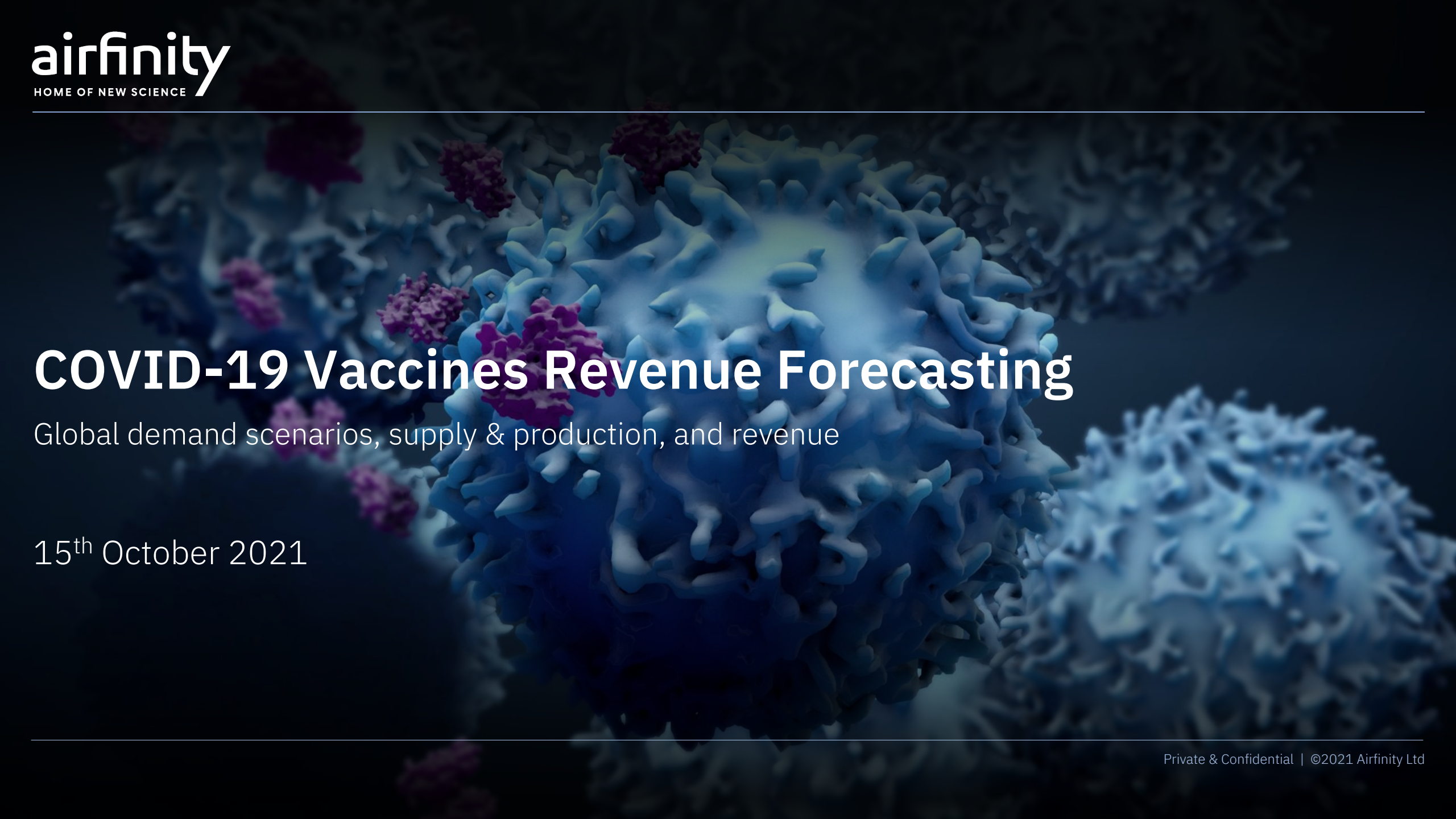


COVID-19 Vaccines Revenue Forecasting

Global demand scenarios, supply & production, and revenue

15th October 2021

Executive summary

Brief overview of Q4,21 and 2022 revenue model

Airfinity predicts Pfizer BioNTech will announce earnings of $10.6 billion in Covid vaccine sales for Q3, a significant jump from $7.8 billion earned last quarter.

Our analysis of vaccine supply, sales and pricing forecasts Pfizer BioNTech's overall revenue for 2021 to reach $31.3 billion, slightly below the company's forecast of $33.5 billion.

Moderna is forecast to make $6.1 billion in revenue for Q3 and $17.6 billion for the whole of 2021. This is below the company's projected $20 billion in revenue for the year.

Airfinity predicts Astrazeneca will achieve vaccine sales of $1billion in Q3 bringing its annual sales forecast to $4.2 billion for 2021. While Johnson & Johnson is forecast to make $852 million in Q3 and $1.8 billion for the year.

Pfizer and Moderna's vaccine looks set to dominate the market next year due to the vaccines' high efficacy and rapid scaling of production.

Airfinity's modelling shows Pfizer BioNTech's sales will increase 77% to $54.5billion in 2022, while Moderna's will increase by 130% to $38.7 billion next year.

High Income Countries (HICs) are expected to generate the biggest proportion of vaccine revenue. Although many rich nations have already completed their initial vaccination programmes, Airfinity predicts these countries will continue to buy more doses and these will have a higher price tag than those sold to Low Income countries.

Pfizer BioNTech is expected to make 64% of its revenue from HIC, while Moderna will make 76%. J&J will make 62% from HIC and 26% from LICs. Astrazeneca is expected to continue selling more to Low and Lower Middle Income Countries and this will account for 44% of its revenue in 2022, but 47% will still be generated by HICs.

It is likely that later in 2022 there will be an oversupply of vaccines, not all of which will be purchased. This forecast focuses on likely sales of doses, not just the number of doses that could be produced.

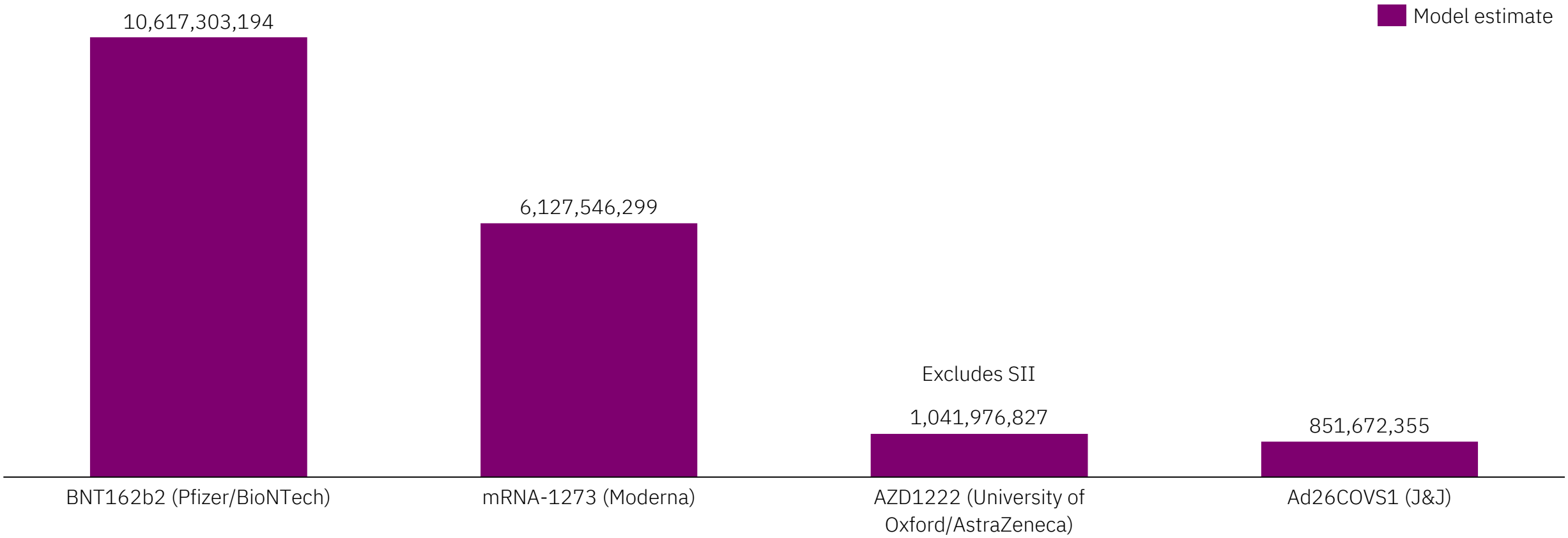
Estimates for Q3 revenue

Model estimates for Q3 revenue (USD)

Large increases in revenue forecasted for all manufacturers

J&J forecast is consistent with the firm's prediction that they'll earn over half their 2021 revenue in Q4[1]

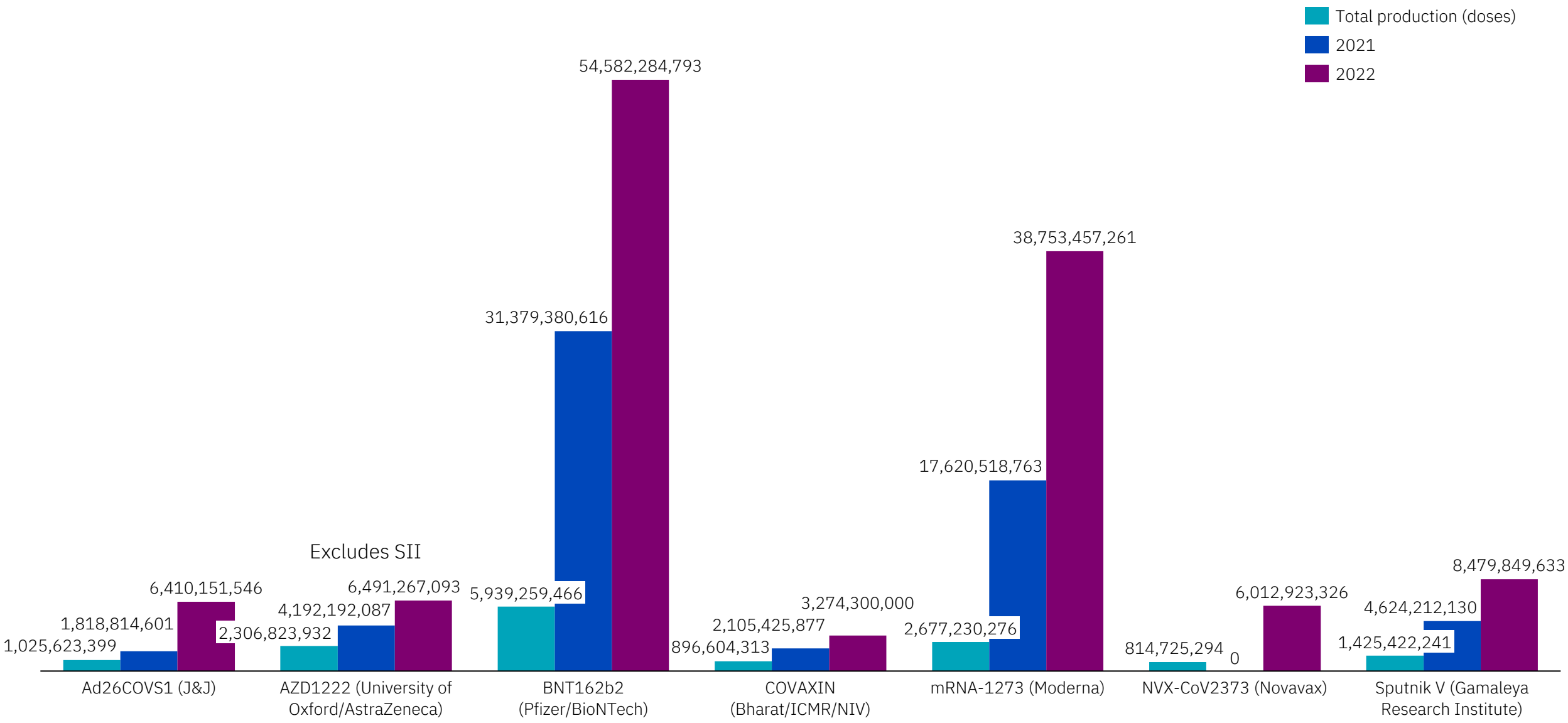
AstraZeneca forecast excludes Serum Institute of India Revenue



1. J&J forecasts $2.5 bln in 2021 COVID-19 vaccine sales, sets lower production target, Reuters, July 21 2021

Moderna set to more than double revenue, with big increase in production

Revenue forecast of COVID vaccines* split by technology type in 2021 and 2022 (USD)



*Excluding Chinese vaccines, which currently make up a large proportion of deliveries

Explaining the 2022 forecast

Three reasons why Pfizer&BioNTech and Moderna are expected to continue explosive growth

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Higher supply in 2022

Both companies have not been running at full capacity all of 2021 and we expect current monthly output to continue or even increase. This means both vaccines will be produced at significant higher numbers in 2022 than in 2021. The assumed numbers of vaccines are below the companies own production forecasts.

Higher demand in 2022

With only 30 pct of the world's population fully vaccinated and a drive towards 70 pct + active booster campaigns globally, the global demand for COVID-19 vaccines are expected to be larger in 2022 than it was in 2021. Even for the Western world alone the demand is expected to be very high given expanded vaccine campaigns to children and given scientific indicators of waning immunity which will drive further push for booster shuts.

Given high efficacy and strong safety profile, we expect both vaccines to be taking market share from other vaccines that have been used in 2021 during supply constraints. We have assumed conservative market share gains.

Higher prices in 2022

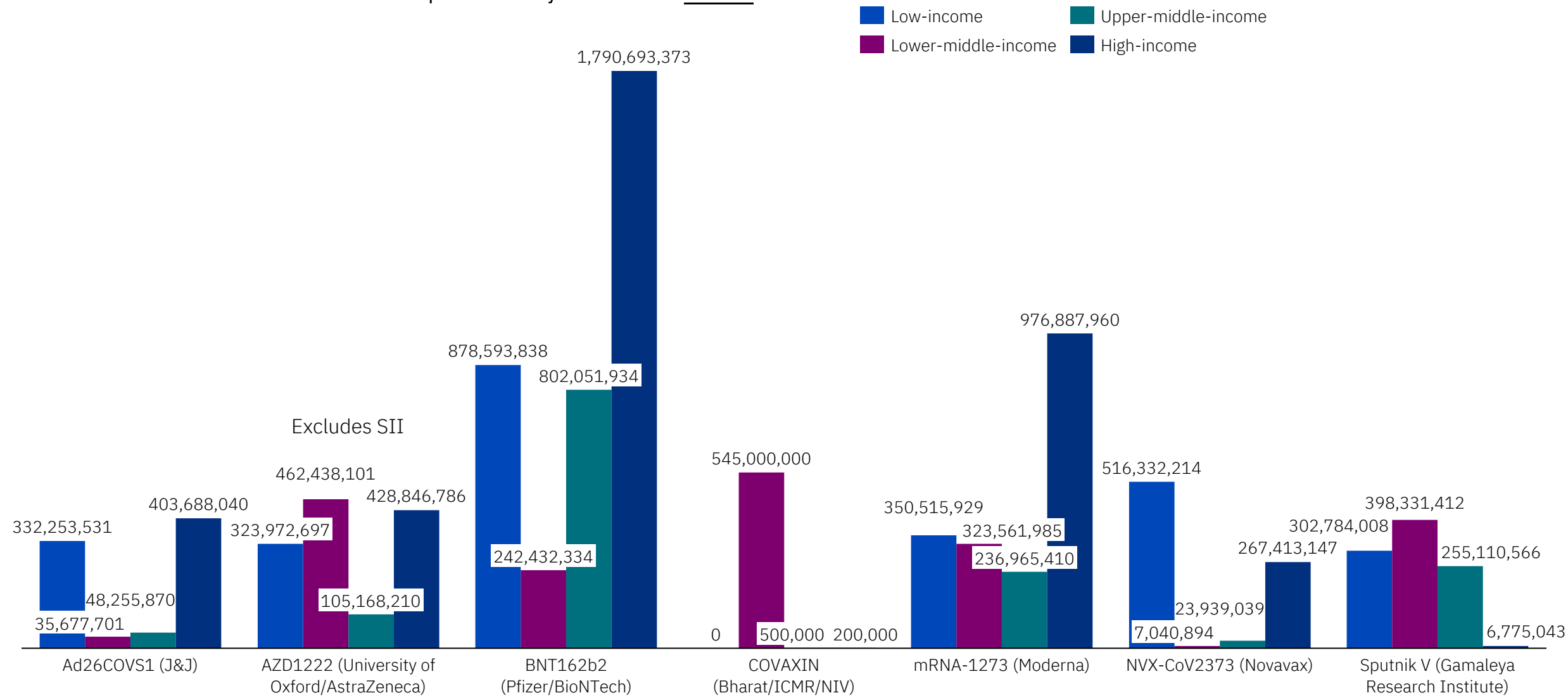
The initial indications from the deals for 2022 and also information from the companies and government procurement agencies is that prices of the vaccines will increase in 2022. Given the strength of these vaccines we think it is likely that they can command a higher price and have assumed a moderate price increase. The assumed price increase is lower than what the companies themselves have indicated.

We do expect to see significant price pressure from vaccines to low and middle income countries and the forecast assumes significantly lower price points to low and middle income countries.

mRNA candidates set to sell more doses to LIC/LMICs at cost price in 2022

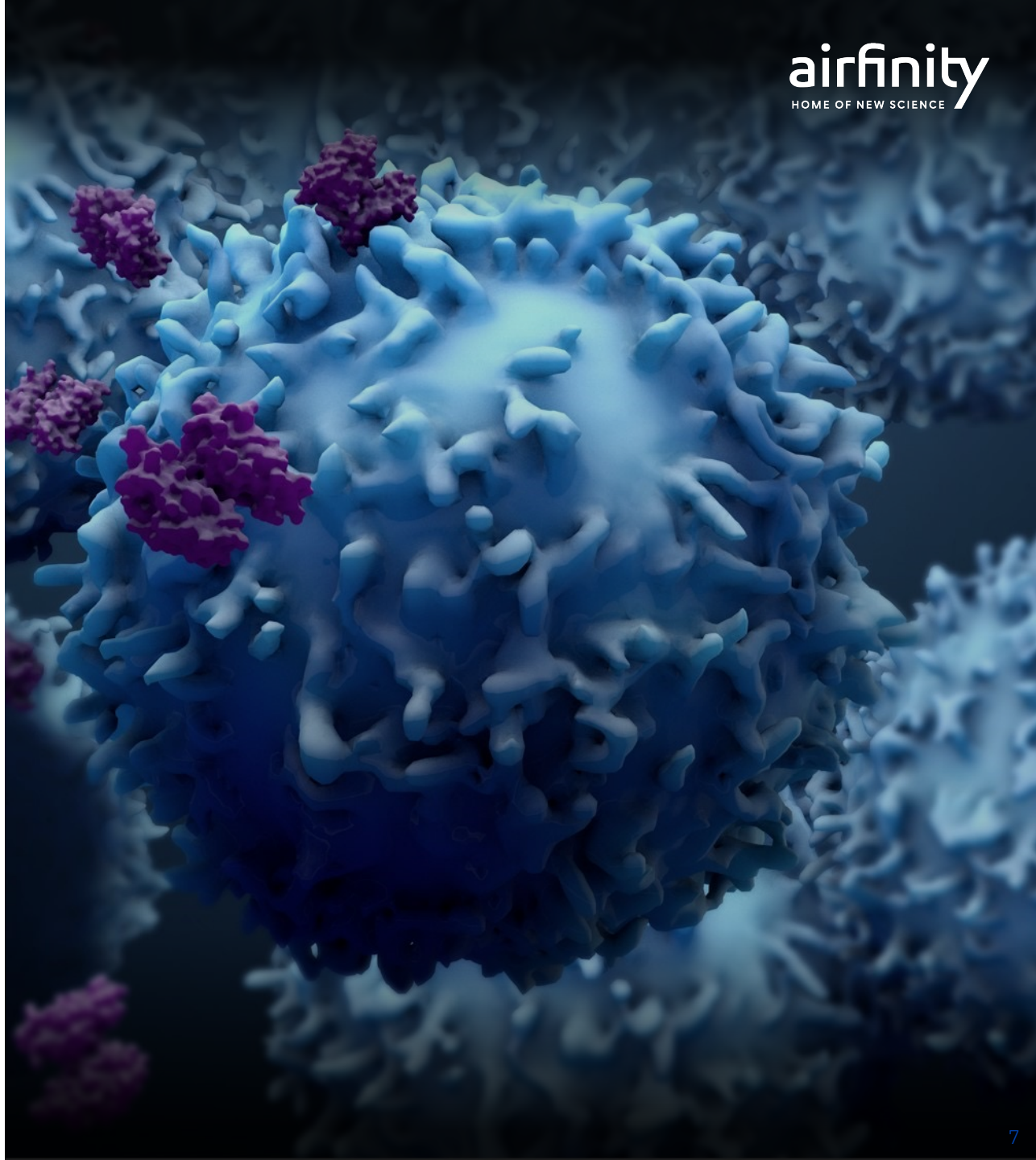
Estimated doses to be sold by income band in 2022, based on 2021 market shares and 2022 demand

Forecasted number of vaccine doses to be sold per vaccine by income band in 2022:



Appendix

Further findings



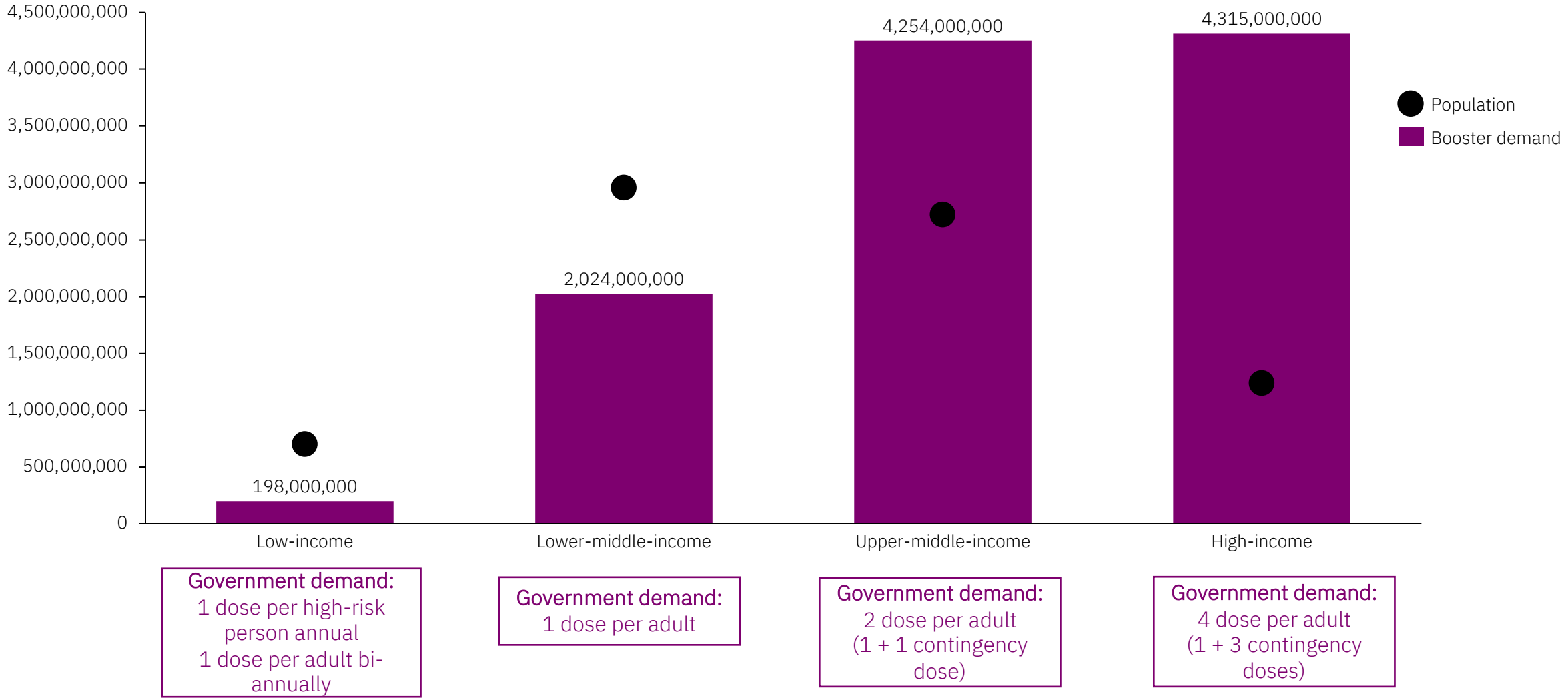
Revenue forecast model assumptions and considerations

Key considerations and assumptions in revenue forecast model:

- Forecasts are calculated, in part, using Airfinity's supply forecasts for each vaccines, which are based on real-time production scale up and deliveries.
- This revenue forecast focuses on currently approved vaccines that have shown strong efficacy, plus Novavax which has also released promising late-stage phase 3 results.
- The revenue forecast excludes Chinese candidates, which have shown poor efficacy results and are unlikely to be purchased longer-term once high-efficacy vaccines become more widely available. For this reason, the Chinese market is also excluded as they are likely to continue relying on their domestic vaccines.
- The forecast also omits other vaccines that have shown poor results or those coming through the pipeline, which are unlikely to match the well-established vaccines' current supply chains.
- The revenue forecast is based on production scale up, but also likely purchasing demand. It is likely that later in 2022 there will be an oversupply of vaccines, not all of which will purchased. This forecast focuses on likely sales of doses, not just the number of doses that could be produced.
- Income bands are taken from the World Bank.
- Prices are estimated based on previous prices paid for the COVID vaccines, with lower-income assumed to pay a lower price per dose for vaccines.
- Market share for each vaccine is split by income band, with some vaccines more suitable for certain infrastructures (i.e. vaccines requiring ultra-cold storage would not be suitable for low income countries, and they are unlikely to be able to afford the higher-priced vaccines). Therefore, 2022 market share has been determined by proxy using the market share of already-purchased vaccines in 2021.
- Booster demand has been estimated per income band, and boosters are likely to begin rolling out at different times, as each country will finish their initial vaccination campaign at different times. Therefore, it is **not** assumed that only boosters will be used in 2022.
- 2022 demand is based on 2021 market share by income band, which is then adjusted to meet demand of undersupplied countries and reducing doses share in oversupplied countries from 2021.

Global demand for booster vaccines from 2022 onwards

Analysis of government booster vaccine demand and population demand



Booster scenarios are assumed based on WHO targets and through current purchases. These scenarios may vary from country-to-country. Higher-income countries likely to invest in diverse portfolios for greater protection

MORE INFORMATION

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Working with the full ecosystem in life sciences, from pharma companies, government agencies, corporates, investors and NGOs and international organizations, Airfinity offers a disease centric platform that turns disconnected data points into accurate forecasts.

Airfinity is specialised in infectious diseases, cardio and oncology. It has built the world's leading COVID-19 science and market intelligence platform.

The company is headquartered in London and partners with organisations worldwide.

Airfinity's COVID-19 data was seen by more than 2 billion people in 2020.

"Airfinity has been instrumental in our country's COVID response"

Head of Government Vaccine Task Force

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