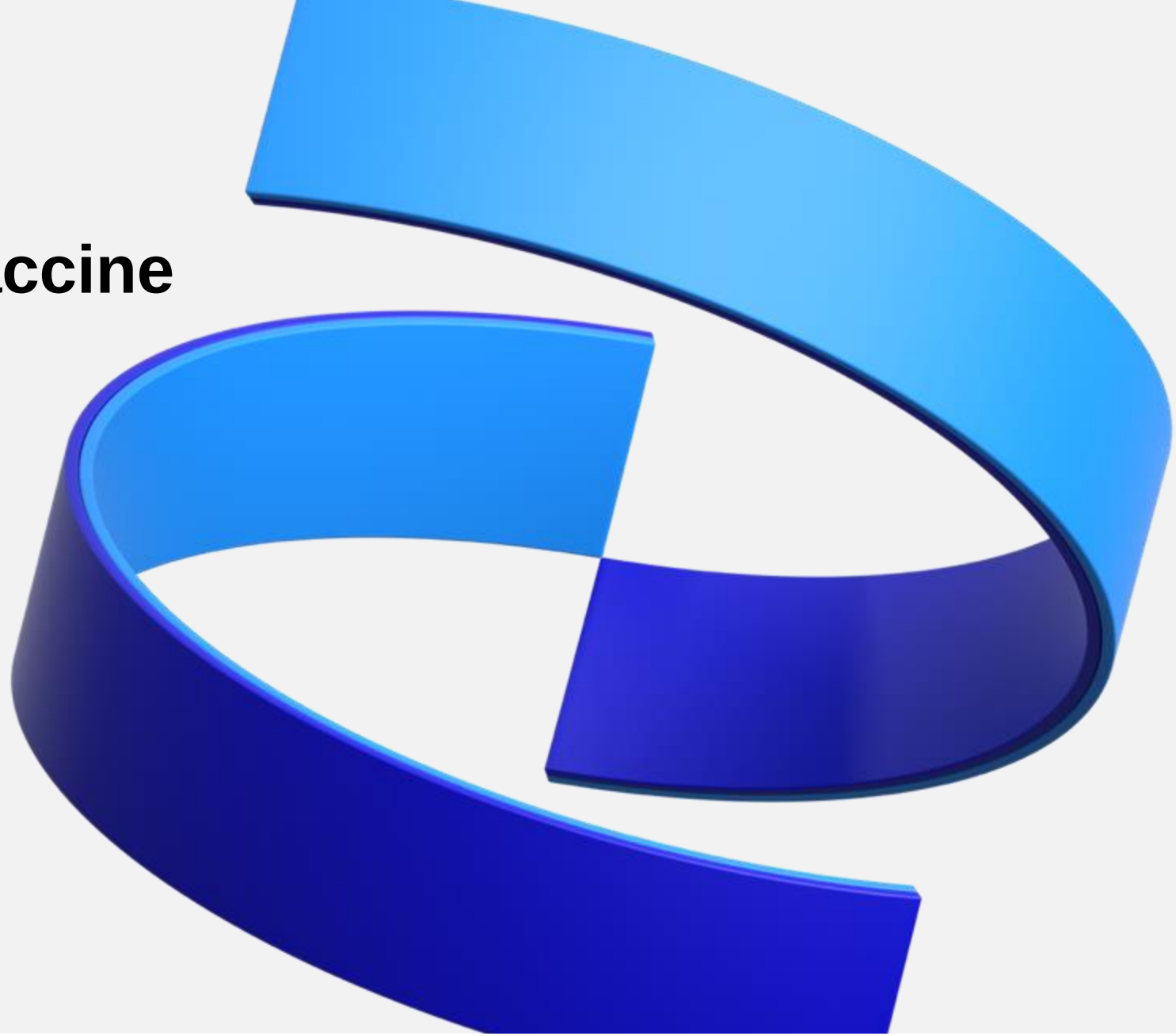
Monovalent XBB.1.5 BNT162b2 COVID-19 Vaccine



ACIP Presentation
September 12, 2023

Presentation Outline

Kayvon Modjarrad, M.D., Ph.D.
Executive Director, Viral Vaccines
Vaccine Research and Development, Pfizer Inc.

Variant Epidemiology

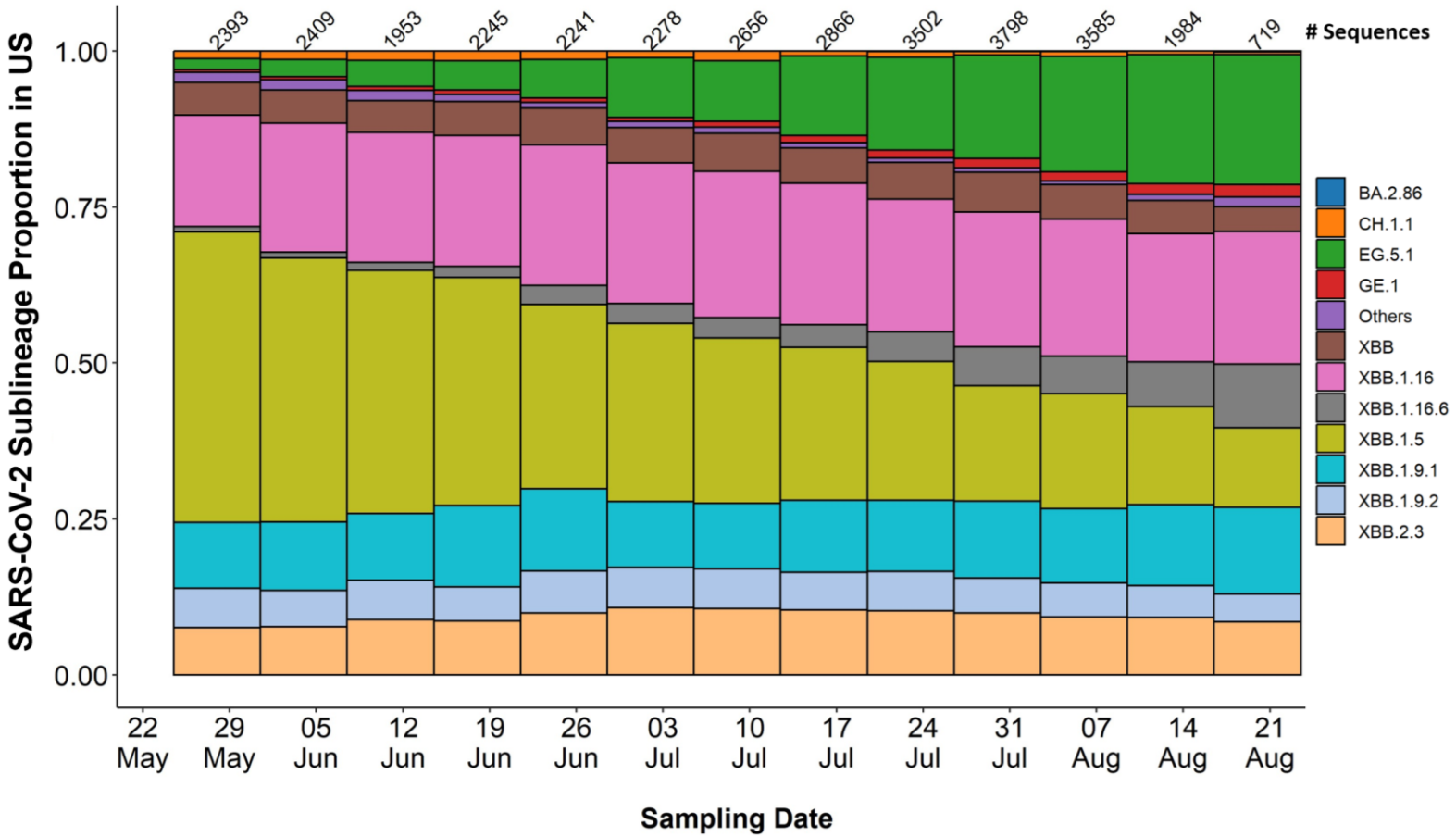
COVID-19 Updated Vaccine Approval Pathway

Monovalent XBB.1.5 BNT162b2 Vaccine Activity Against Contemporary Omicron Sublineages

Clinical Update

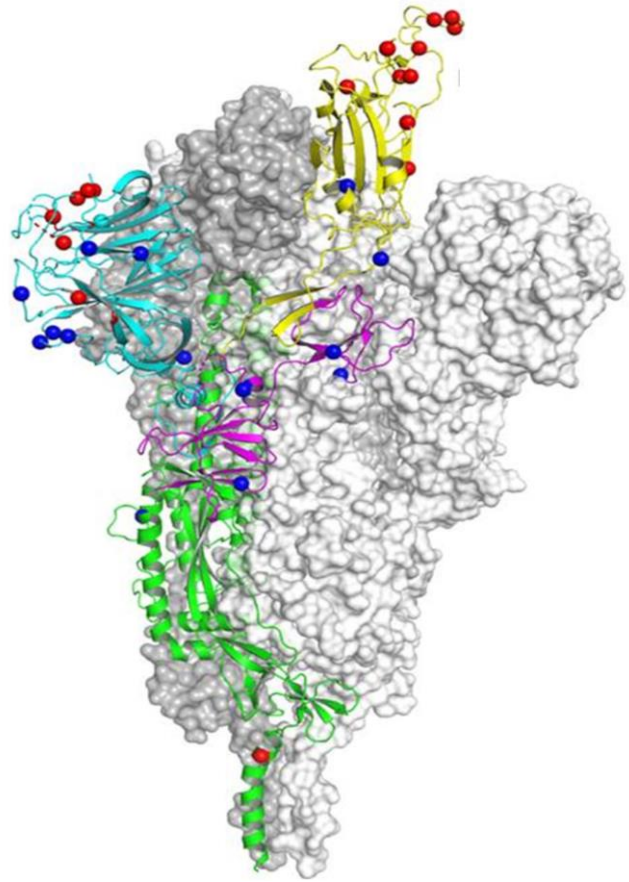
XBB Sublineages Continue to Dominate the Epidemiologic Landscape, Despite the Emergence of New Lineages

Growing Dominance of EG.5.1



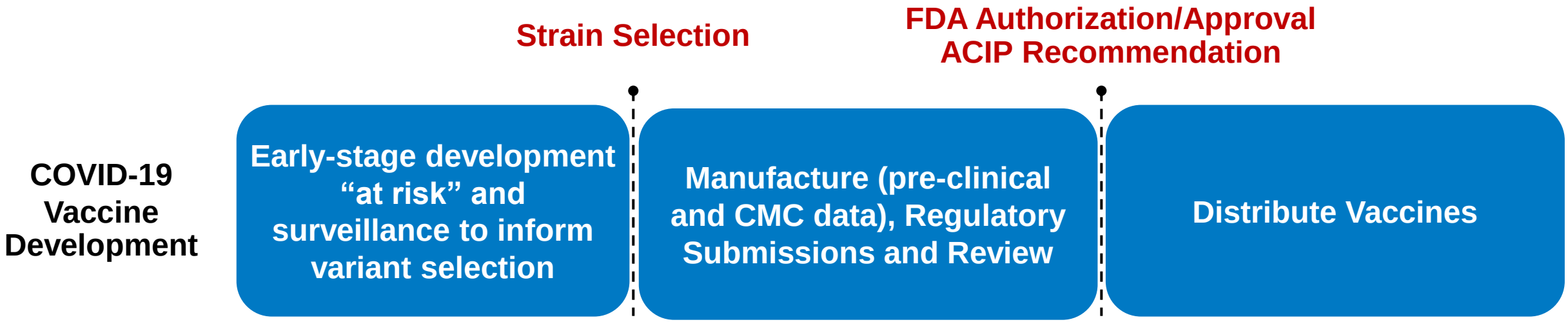
Source: GISAID - gisaid.org, data accessed/analyzed in Pizer, September 08, 2023

BA.2.86 has high mutational density in Spike protein but accounts for <1% of cases



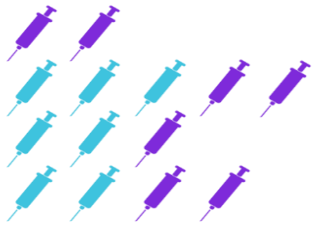
Source: 3D Spike Model - Pfizer
Mutation Prediction - *jbloomlab.github.io/SARS2-RBD-escape-calc*

Pathway for COVID-19 Variant-Adapted Vaccine Updates

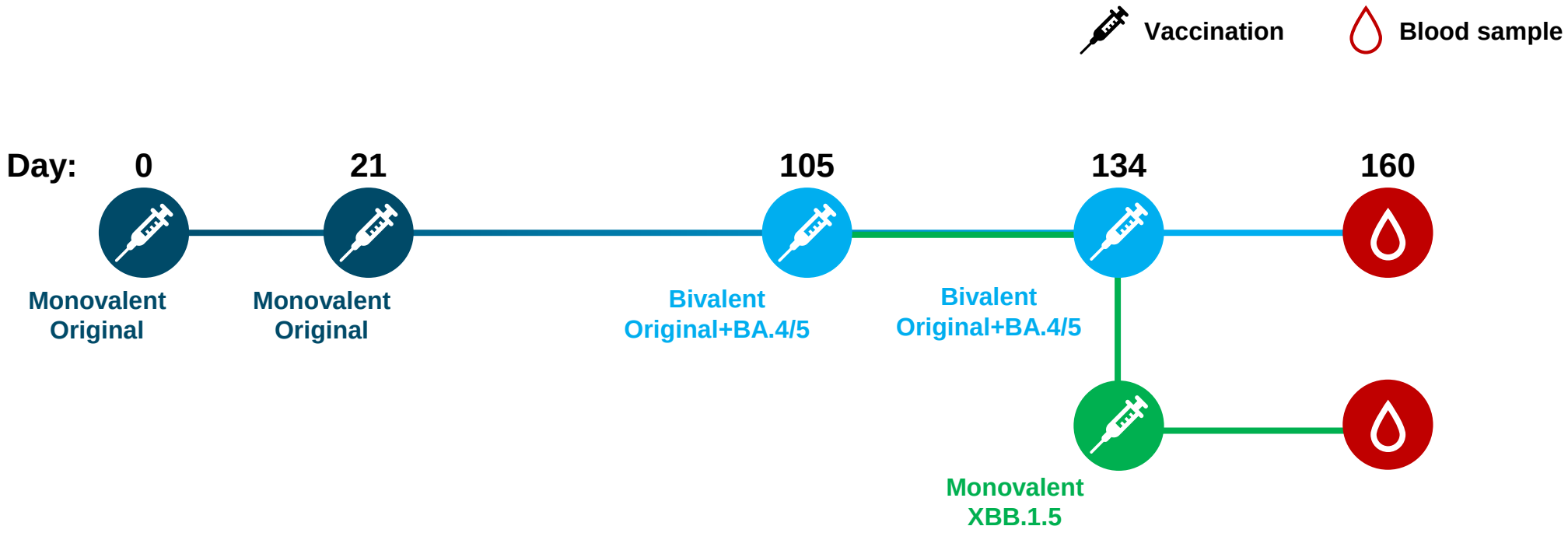


- In accordance with FDA guidance for licensure, preclinical/CMC data package submission and review help ensure timely availability of seasonal variant-matched vaccine, similar to the model for annual influenza vaccine updates.

Clinical and Preclinical Experience with Variant-modified Vaccines – Supported Bivalent BA.4/5 Vaccine Authorization

Modified Vaccine	Age Group	Vaccine Regimen	Clinical Data	Preclinical Data
Beta monovalent	**18 to 55 years**		✓ ✓ ✓	✓ ✓ ✓
Omicron BA.1 monovalent	**18 to 55 years**		✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
Omicron BA.1 bivalent	**18 to 55 years** **>55 years**		✓	✓
Omicron BA.4/5 bivalent	**6 months to 11 years** **12 to 55 years** **>55 years**		✓	✓
Omicron XBB.1.5 monovalent	**12 to 55 years** **>55 years**	**Single Dose** 	**Ongoing**	✓

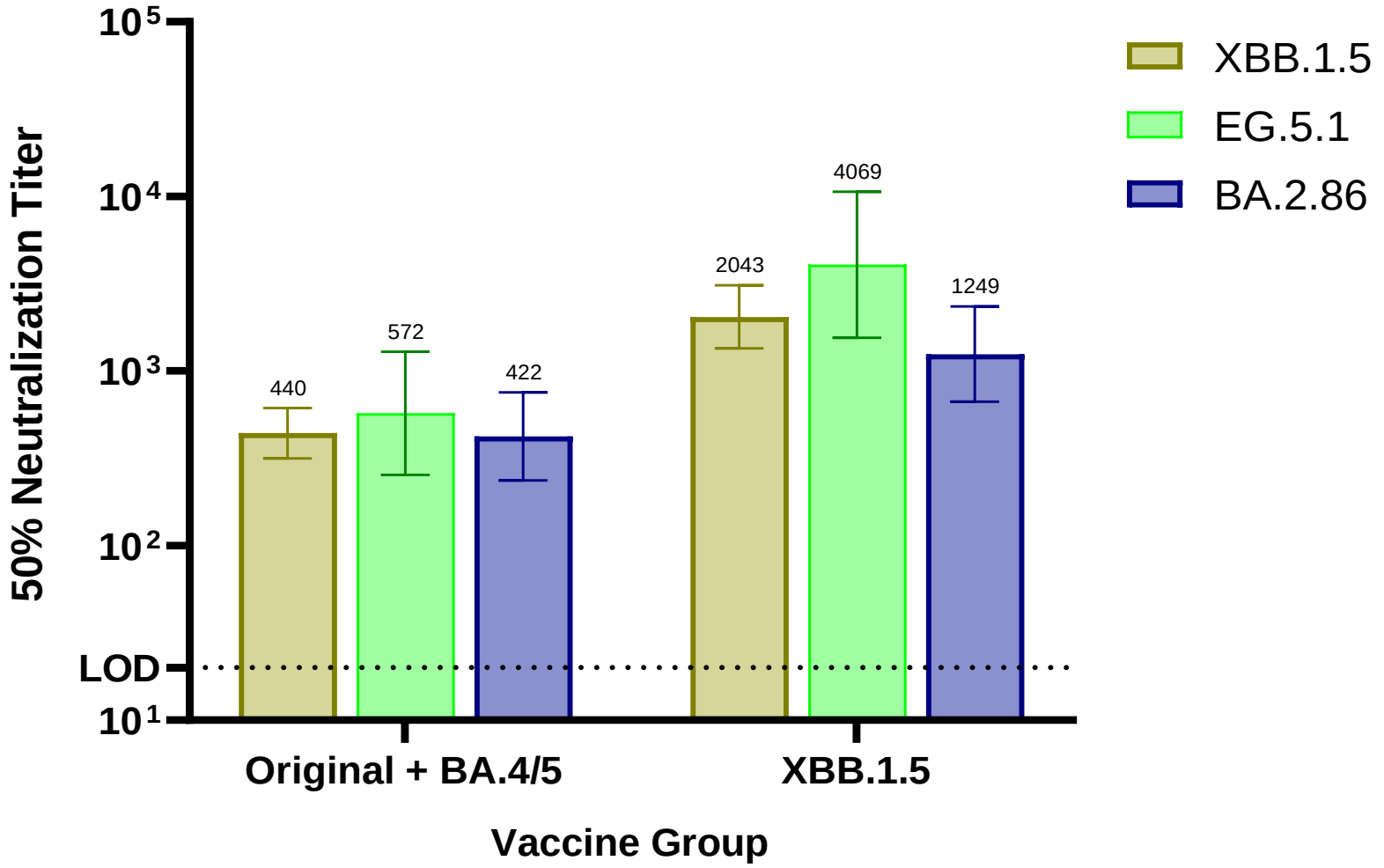
Booster Vaccination Study Design



Female Balb/c mice (10 per group) were experienced with a primary series of monovalent BNT162b2 Original vaccine and a 3rd booster dose of bivalent BNT162b2 (Original+BA.4/5) vaccine. Mice then received a 4th booster dose of either a bivalent BNT162b2 (Original+BA.4/5) or a monovalent BNT162b2 (XBB.1.5) vaccine.

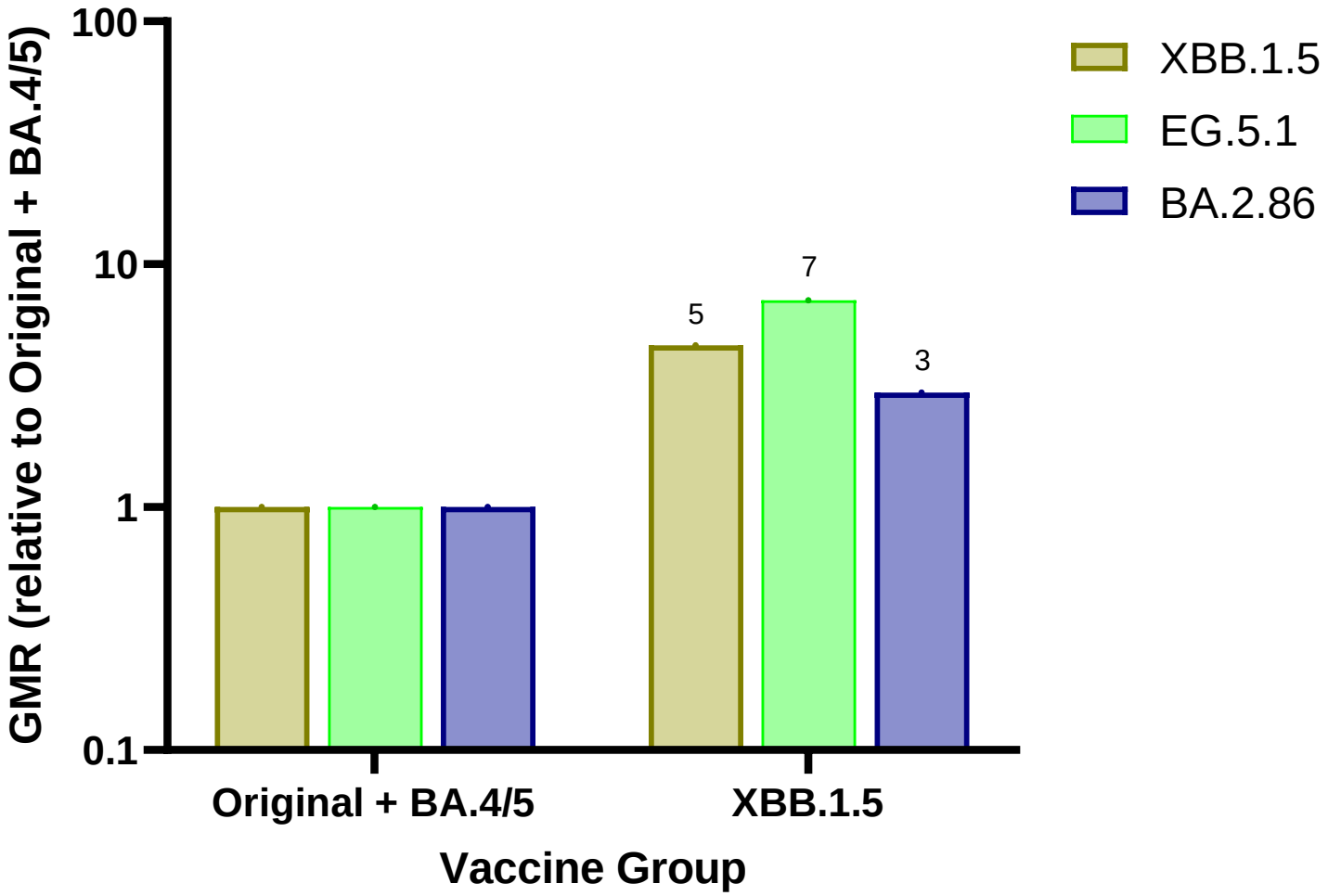
Data were generated by same pseudovirus neutralization assay and from sera of same mouse study presented at VRBPAC June 15, 2023 meeting (https://www.fda.gov/media/169541/download).
Data on file: Pfizer-BioNTech. September 2023.

Monovalent XBB.1.5 BNT162b2 Booster Vaccine Effectively Neutralized Predominant and Emerging Variants



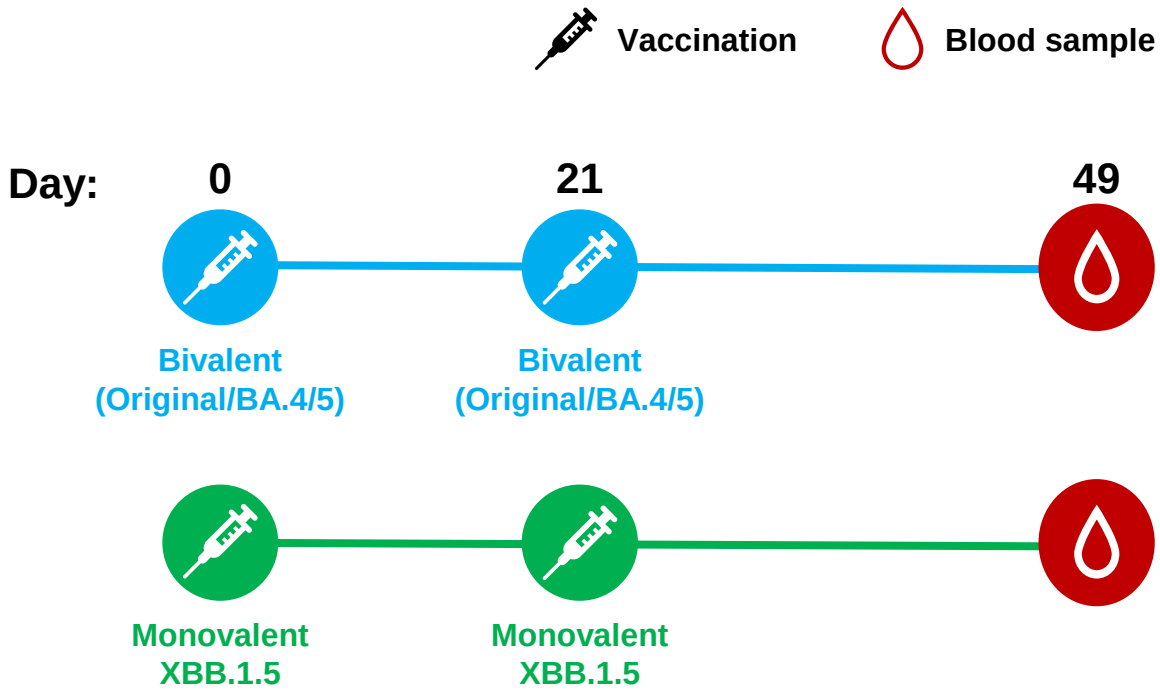
Data were generated by the same pseudovirus neutralization assay and from sera of same mouse study that generated data that were presented at VRBPAC June 15, 2023 Meeting (https://www.fda.gov/media/169541/download).
50% Neutralization Titers are Geometric Mean Titers of 10 mice per vaccine group. LOD, limit of detection; the lowest serum dilution of 1:20.

Monovalent XBB.1.5 BNT162b2 Booster Vaccine Elicited Substantially Higher Neutralizing Response Compared to the Bivalent Vaccine



Data were generated by same pseudovirus neutralization assay and from sera of same mouse study that generated data that were presented at VRBPAC June 15, 2023 Meeting (https://www.fda.gov/media/169541/download).
GMR = Geometric Mean Ratio of the Geometric Mean Titer (GMT) of Monovalent XBB.1.5 divided by GMT of WT+BA.4/5 group. LOD, limit of detection; the lowest serum dilution of 1:20.

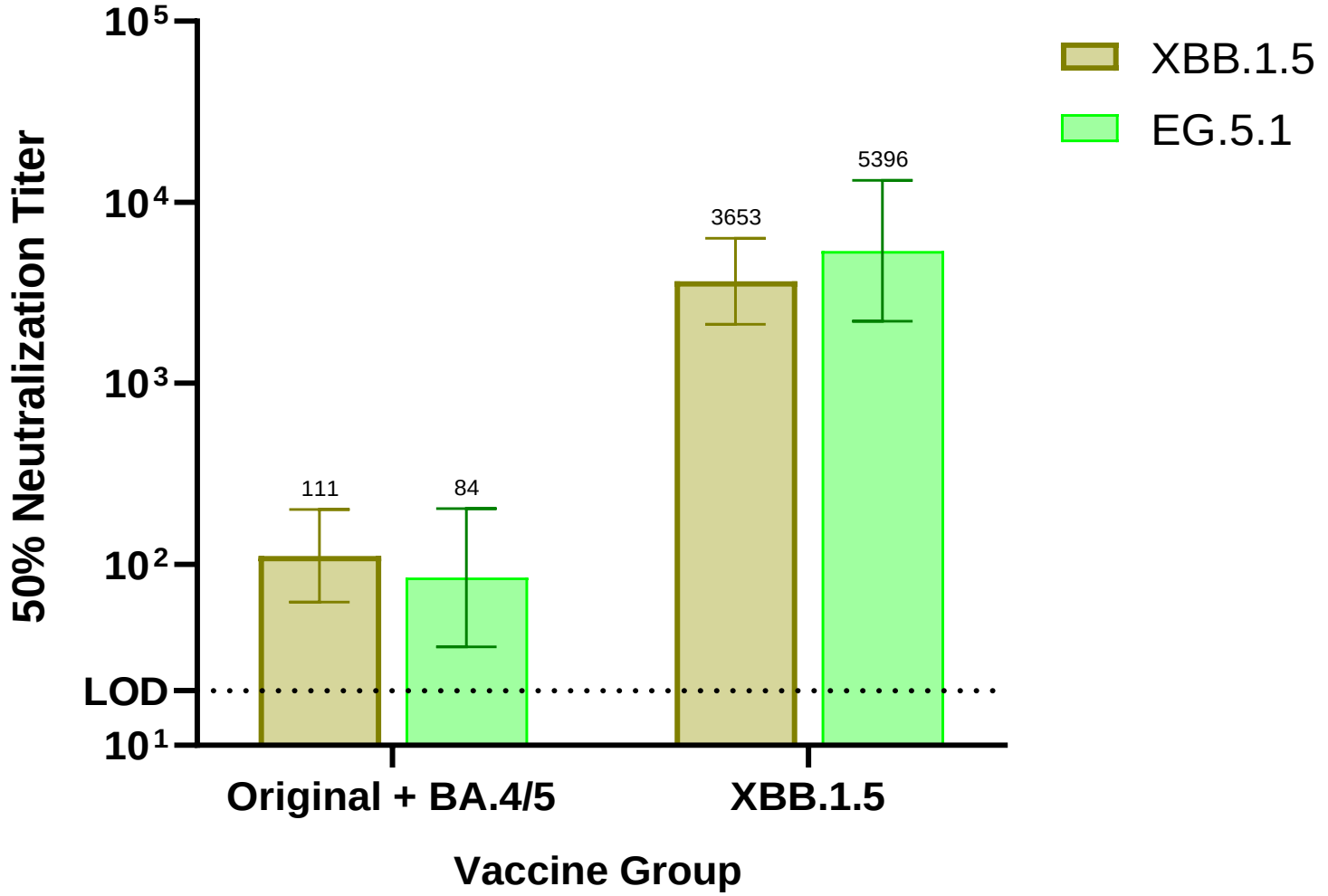
Primary Series Study Design



Female Balb/c mice (10 per group) were administered 2 doses (21 days apart) of either bivalent BNT162b2 (Original+BA.4/5) or monovalent BNT162b2 (XBB.1.5) vaccine.

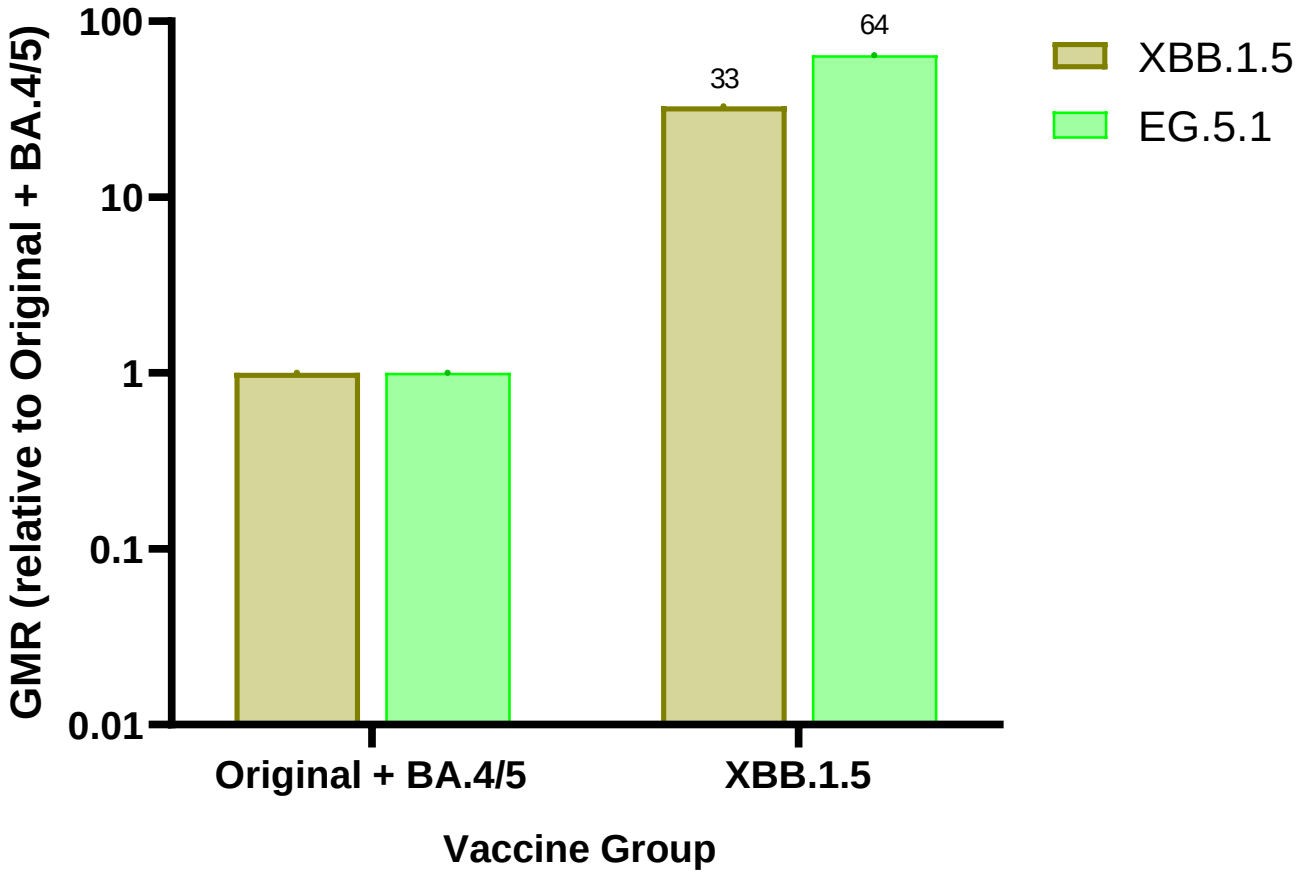
Data were generated by same pseudovirus neutralization assay and from sera of same mouse study presented at VRBPAC June 15, 2023 meeting (https://www.fda.gov/media/169541/download).
Data on file: Pfizer-BioNTech. September 2023.

Monovalent XBB.1.5 BNT162b2 Primary Series Effectively Neutralized EG.5.1 and XBB.1.5



These data were generated by same pseudovirus neutralization assay and from sera of same mouse study that generated data that were presented at VRBPAC June 15, 2023 Meeting (https://www.fda.gov/media/169541/download).
50% Neutralization Titers are Geometric Mean Titers of 10 mice per vaccine group.
LOD, limit of detection; the lowest serum dilution of 1:20.

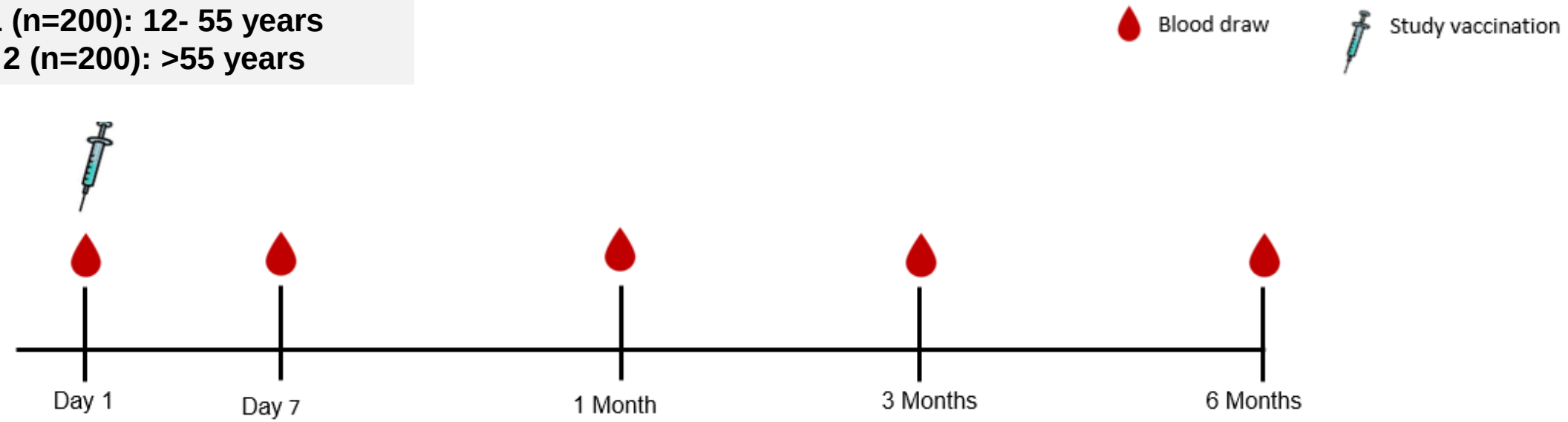
Monovalent XBB.1.5 BNT162b2 Primary Series Elicited Substantially Higher Neutralizing Response Compared to the Bivalent Vaccine



These data were generated by same pseudovirus neutralization assay and from sera of same mouse study that generated data that were presented at VRBPAC June 15, 2023 Meeting (https://www.fda.gov/media/169541/download).
GMR = Geometric Mean Ratio of the Geometric Mean Titer (GMT) of Monovalent XBB.1.5 and Bivalent XBB.1.5+BA.4/5 divided by GMT of WT+BA.4/5 group.
LOD, limit of detection; the lowest serum dilution of 1:20.

Monovalent XBB.1.5 BNT162b2 Clinical Study in Individuals ≥ 12 years

Monovalent XBB.1.5 BNT162b2 30µg
Group 1 (n=200): 12- 55 years
Group 2 (n=200): >55 years



Summary

- The SARS-CoV-2 epidemiologic landscape remains dominated by XBB sublineages.
- Monovalent XBB.1.5 BNT162b2 is equally immunogenic against XBB.1.5, EG.5.1 and BA.2.86, in a COVID-19 vaccine-experienced preclinical study.
- Variant-adapted vaccines improve immune responses against antigenically matched and closely related strains.
- A preclinical/CMC package for variant-adapted COVID-19 vaccine fulfilled licensure criteria.

Monovalent XBB.1.5 Pfizer-BioNTech COVID-19 Vaccine

ACIP
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