

MenABCWY Meningococcal Vaccine

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MenABCWY Vaccine Overview

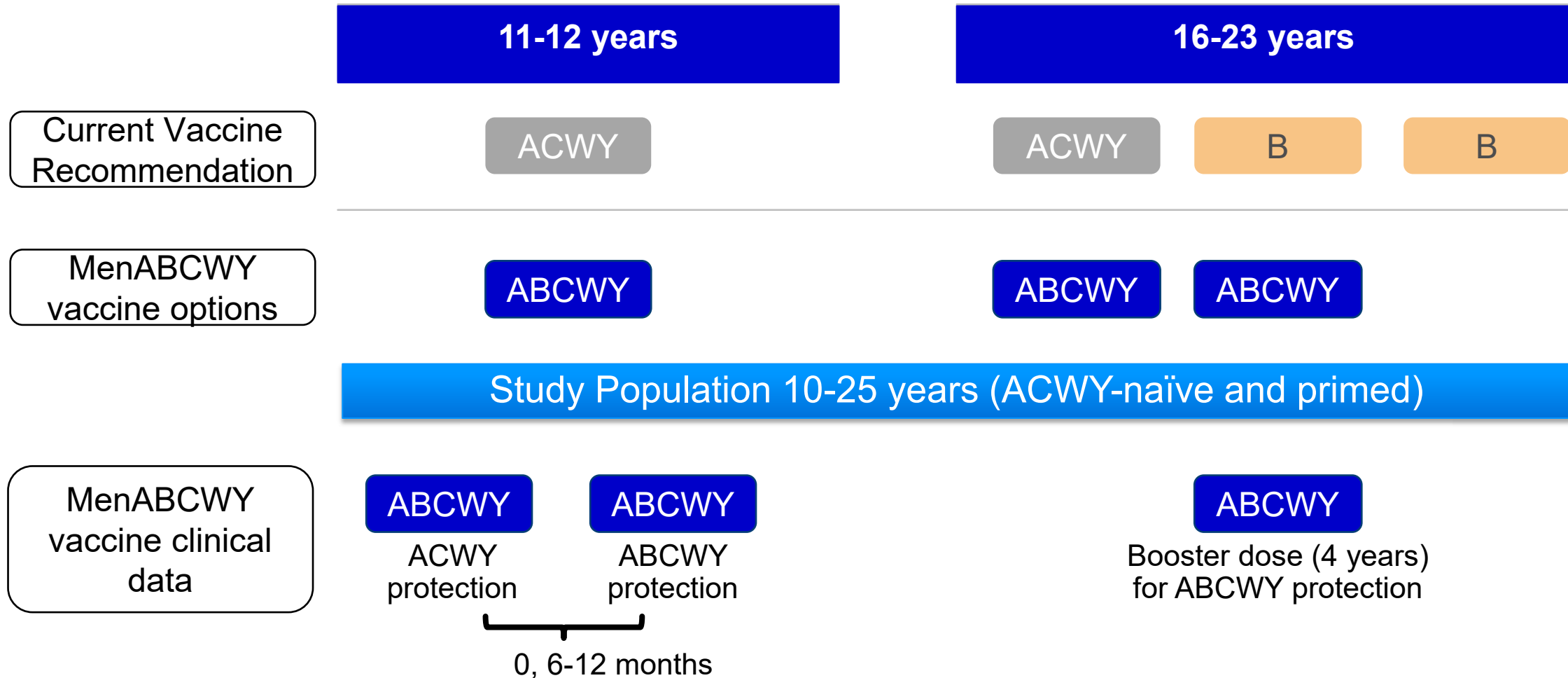
Indication and dosing being sought for MenABCWY vaccine

- Active immunization of individuals 10 through 25 years of age against invasive meningococcal diseases caused by *Neisseria meningitidis* serogroups A, B, C, W, Y
- Dosing:
 - Administer two doses at least 6 months apart for prevention of meningococcal disease caused by serogroups A, B, C, W and Y.
 - Administer one dose for prevention of meningococcal disease caused by serogroups A, C, W and Y.
 - A booster dose may be administered to individuals who have previously completed a primary series with MenABCWY or MenB-fHbp vaccine or who have previously received MenACWY conjugated vaccines

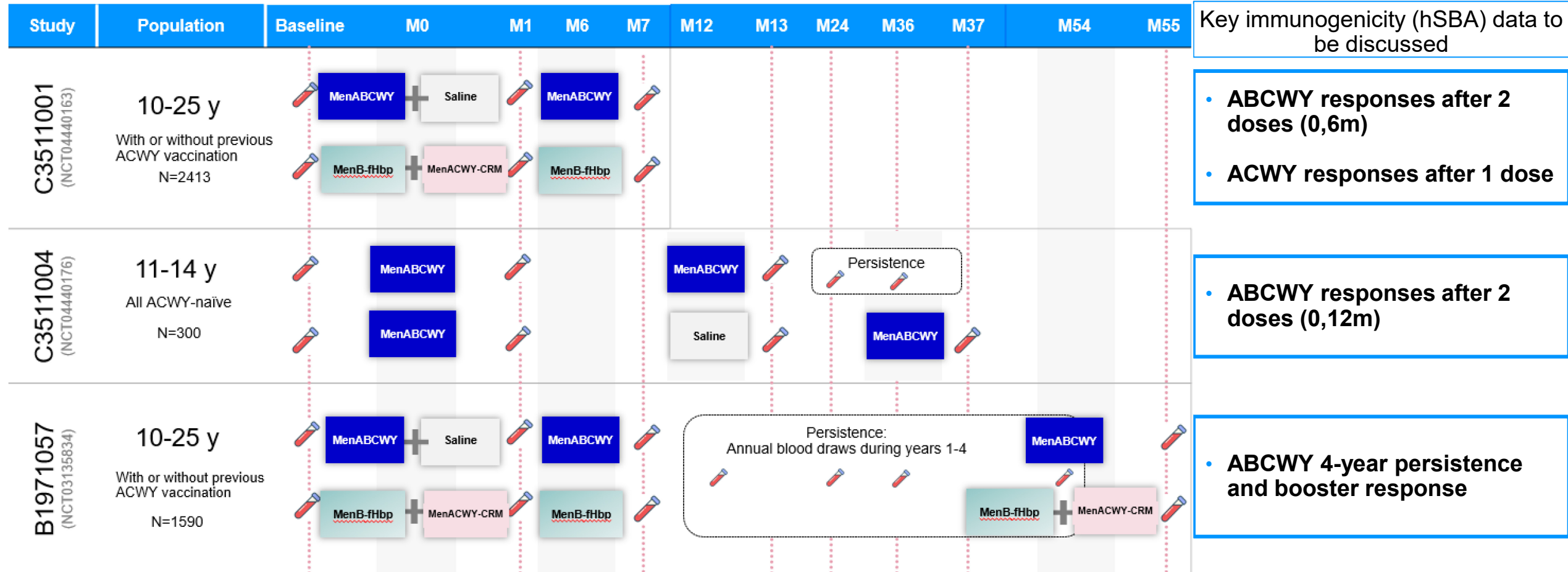
MenABCWY vaccine composition

- MenABCWY vaccine is composed of drug substance from:
 - Trumenba® (MenB-fHbp): licensed in the US for the prevention of invasive disease caused by *Neisseria meningitidis* group B in individuals 10 through 25 years of age
 - Nimenrix® (MenACWY-TT): licensed ex-US for the prevention of invasive disease caused by *Neisseria meningitidis* serogroups A, C, W, and Y in individuals 6 weeks of age and older.

Adolescent meningococcal vaccination platform options for MenABCWY vaccine



MenABCWY vaccine clinical program overview



- All participants were meningococcal serogroup B vaccine naïve prior to study entry
- 80% of participants in the Phase 3 study were Caucasian; 10% black and African Americans; 25% of participants being Hispanic or Latino

An abstract, three-dimensional blue geometric shape, resembling a stylized DNA helix or a complex molecular structure, curves across the top and right side of the slide. It is composed of several flat, triangular and quadrilateral facets in various shades of blue, creating a sense of depth and movement.

Immunogenicity

Immunogenicity objectives and endpoints

FDA agreement for licensure

ACWY evaluation (non-inferiority after 1 and 2 doses of MenABCWY vaccine versus MenACWY-CRM)

- hSBA seroresponse* (4-fold)
- Naïve and primed participants

B evaluation (non-inferiority after 2 doses of MenABCWY vaccine versus MenB-fHbp)

- hSBA seroresponse* (4-fold)
- Composite response[†]

ABCWY evaluation (Other endpoints)

- hSBA thresholds (1:4, 1:8, 1:16)
- GMTs

MenB immunogenicity analysis: Same approach taken as for Trumenba licensure in the US

- **4 MenB test strains utilized**, 2 from Factor H Binding Protein (fHbp) subfamily A (A22, A56) and 2 from subfamily B (B24, B44)
- **hSBA results provide information on breadth of coverage against MenB strains**
- All strains express **vaccine-heterologous fHbp variants**
- **Strains and fHbp variants** expressed are representative of known genetic diversity; strains were randomly selected
- hSBA seropositivity defined as titers $\geq 1:8$ or $\geq 1:16$, which is greater than the 1:4 correlate of protection

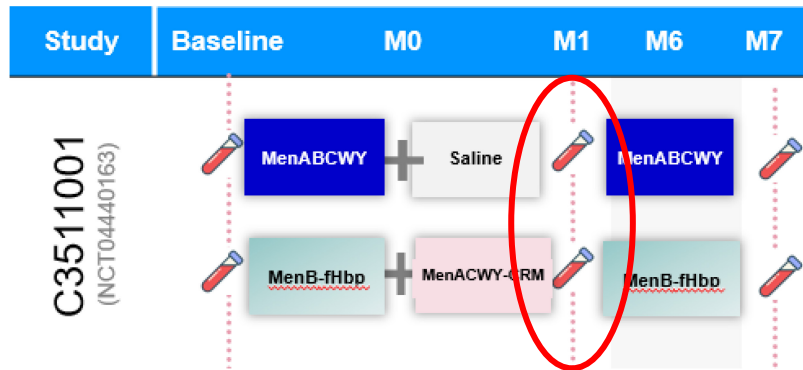
Abbreviations: hSBA=human serum bactericidal assay; GMT=geometric mean titer; MenB=serogroup B

*For participants with a baseline hSBA titer $< 1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $< 1:8$ ($< 1:16$ for A22), seroresponse is a titer ≥ 4 times the 1:8 (1:16 for A22). For those with a baseline hSBA titer $\geq 1:8$ ($\geq 1:16$ for A22), seroresponse is a titer ≥ 4 times the baseline titer. [†]hSBA titer $\geq 1:8$ (1:16 for A22) for all 4 primary strains 1 month after Dose 2.

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Immunogenicity ACWY-naive

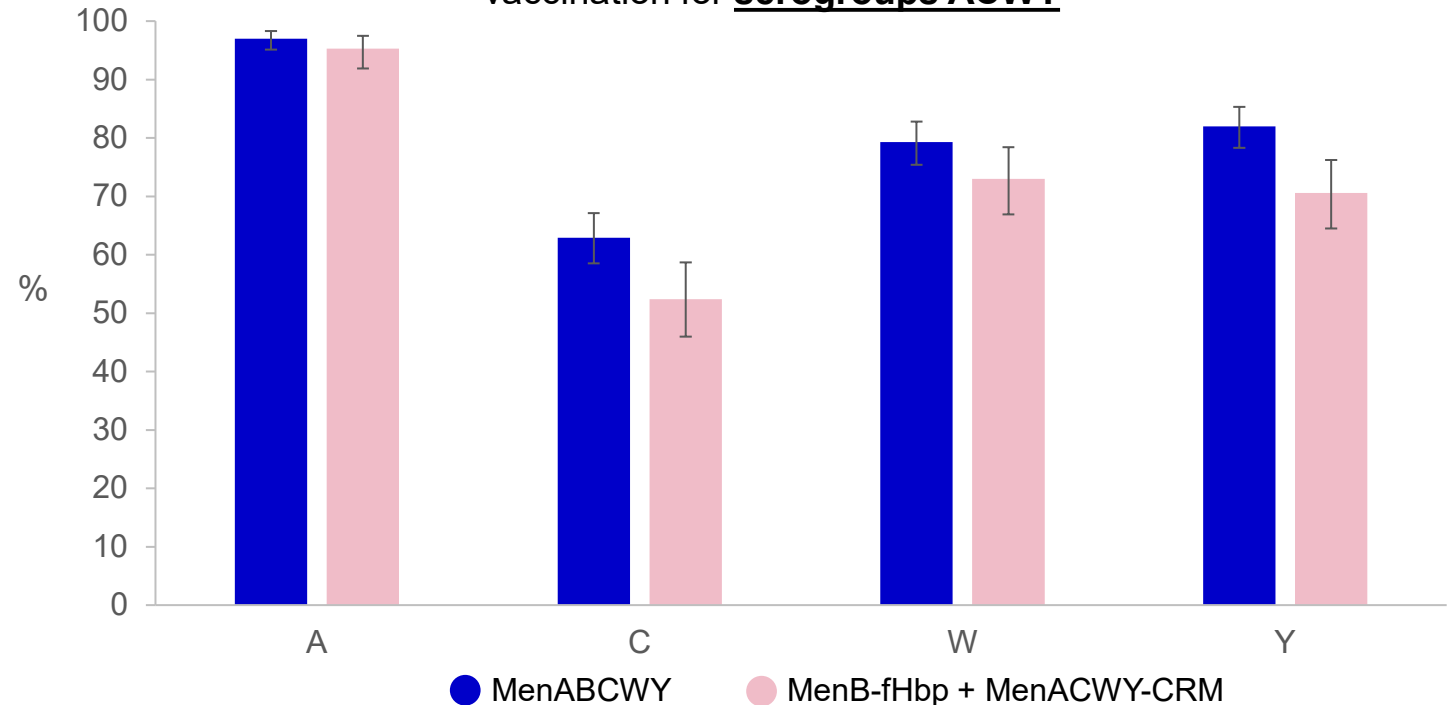
A single dose of MenABCWY vaccine can be used as an alternative to ACWY vaccines in ACWY-naïve adolescents



Comparisons (ACWY-naïve participants):

- MenABCWY vaccine 1 month after first dose
- MenACWY-CRM 1 month after single dose

Percentage of participants achieving hSBA seroresponse* 1 month after vaccination for **serogroups ACWY**



- 1 dose of MenABCWY vaccine was **noninferior** to 1 dose of MenACWY-CRM in ACWY-naïve participants
- 82.4%-99.4% of participants had serogroups ACWY hSBA titers $\geq 1:8$ after 1 dose of MenABCWY vaccine

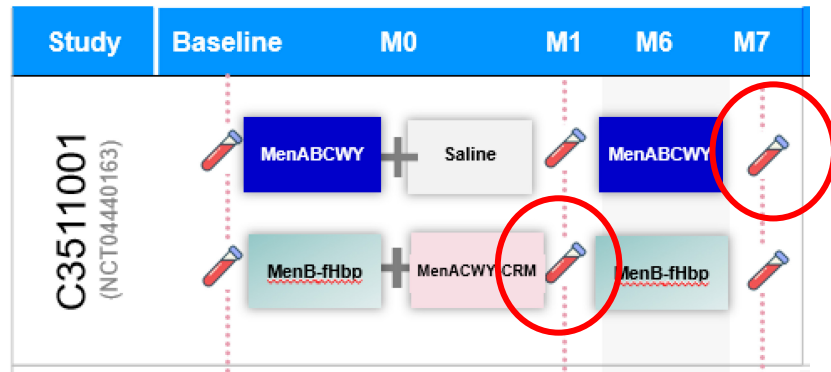
Abbreviations: hSBA=serum bactericidal assay using human complement.

*For participants with a baseline hSBA titer $< 1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $< 1:8$, seroresponse is a titer ≥ 4 times the 1:8. For those with a baseline hSBA titer $\geq 1:8$, seroresponse is a titer ≥ 4 times the baseline titer.

N=492-501 for MenABCWY group; N=244-254 for MenB-fHbp + MenACWY-CRM group.

Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

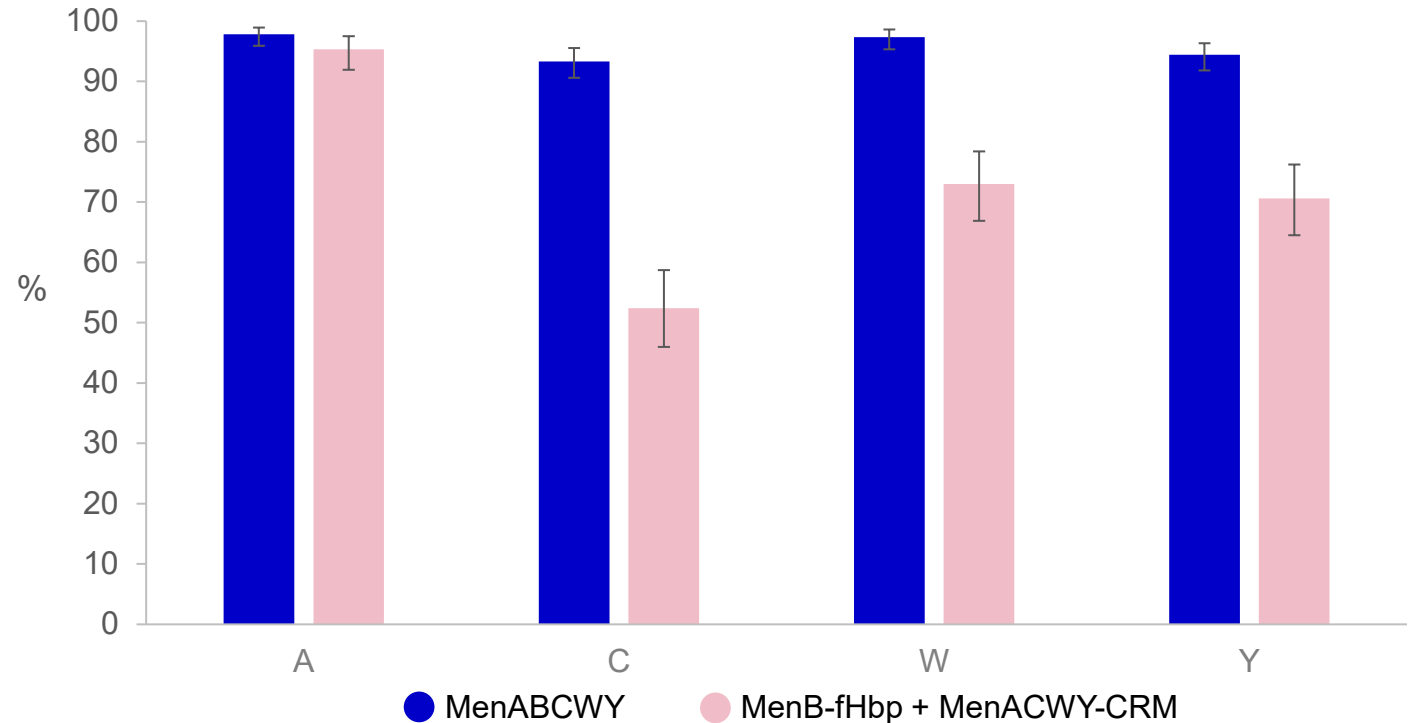
2 doses of MenABCWY vaccine elicit higher responses versus a single dose of MenACWY-CRM in ACWY-naïve participants



Comparisons (ACWY-naïve participants):

- MenABCWY vaccine 1 month after second dose
- MenACWY-CRM 1 month after single dose

Percentage of participants achieving hSBA seroresponse* 1 month after vaccination for **serogroups ACWY**



- 2 doses of MenABCWY vaccine were **noninferior** to 1 dose of MenACWY-CRM in ACWY-naïve participants
- 99.1-99.8% of participants had serogroups ACWY hSBA titers $\geq 1:8$ after 2 doses of MenABCWY vaccine

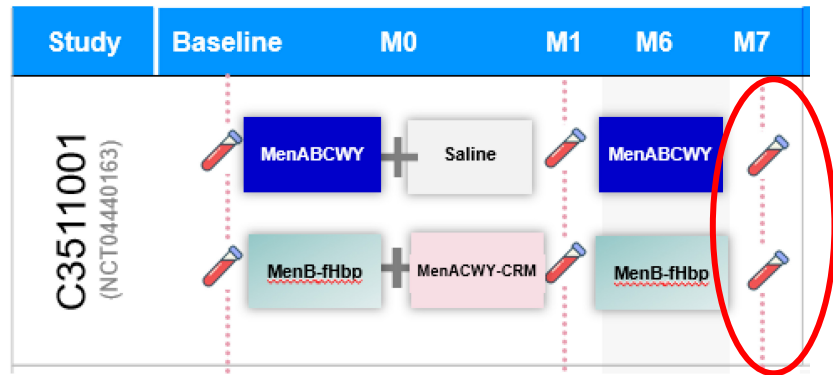
Abbreviations: hSBA=serum bactericidal assay using human complement.

*For participants with a baseline hSBA titer $< 1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $< 1:8$, seroresponse is a titer ≥ 4 times the 1:8. For those with a baseline hSBA titer $\geq 1:8$, seroresponse is a titer ≥ 4 times the baseline titer.

N=439-451 or MenABCWY group; N=244-254 for MenB-fHbp + MenACWY-CRM group.

Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

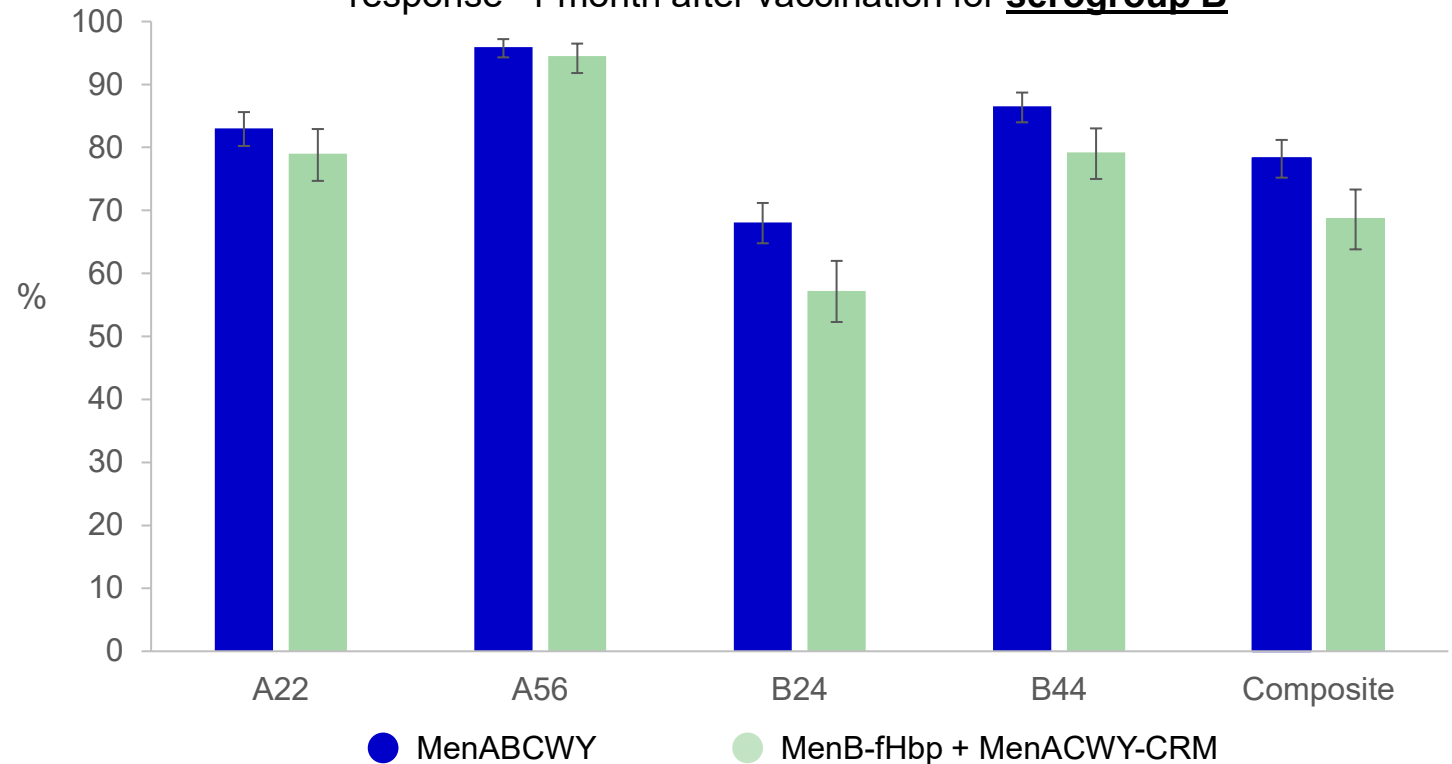
2 doses of MenABCWY vaccine elicit higher responses versus 2 doses of MenB-fHbp in B-naïve participants



Comparisons (B-naïve participants):

- MenABCWY vaccine 1 month after second dose
- MenB-fHbp 1 month after second dose

Percentage of participants achieving hSBA seroresponse* and composite response† 1 month after vaccination for **serogroup B**



- 2 doses of MenABCWY vaccine were **noninferior** to 2 doses of MenB-fHbp
- 83.4-98.7% of participants had serogroup B hSBA titers $\geq 1:8^{\wedge}$ after 2 doses of MenABCWY vaccine

Abbreviations: hSBA=serum bactericidal assay using human complement.

*For participants with a baseline hSBA titer $<1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $<1:8$ ($<1:16$ for A22), seroresponse is a titer ≥ 4 times the 1:8 (1:16 for A22).

For those with a baseline hSBA titer $\geq 1:8$ ($\geq 1:16$ for A22), seroresponse is a titer ≥ 4 times the baseline titer. †hSBA titer $\geq 1:8$ ($\geq 1:16$ for A22) for all 4 MenB strains 1 month after Dose 2. $^{\wedge}\geq 1:16$ for A22 strain

N=755-845 for MenABCWY group; N=383-419 for MenB-fHbp + MenACWY-CRM group.

Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

MenABCWY vaccine protects against all 5 serogroups with 2 doses given 6 to 12 months apart

Seroresponse* 1m PD2		MenABCWY 0, 6m (Study 1001)		MenABCWY 0, 12m (Study 1004)		
Serogroups	N^	%	95% CI	N^	%	95% CI
A	447	97.8	95.9, 98.9	116	99.1	95.3, 100
C	451	93.3	90.6, 95.5	115	99.1	95.3, 100
W	439	97.3	95.3, 98.6	113	99.1	95.2, 100
Y	446	94.4	91.8, 96.3	111	98.2	93.6, 99.8
MenB strain						
A22	778	83.0	80.2, 85.6	111	95.5	89.8, 98.5
A56	807	95.9	94.3, 97.2	115	100	96.8, 100
B24	833	68.1	64.8, 71.2	113	92.9	86.5, 96.9
B44	845	86.5	84.0, 88.7	116	94.8	89.1, 98.1
MenB composite hSBA response†						
Before Dose 1	812	1.2	0.6, 2.3	114	0.9	0.0, 4.8
1 Month after Dose 2	755	78.3	75.2, 81.2	110	96.4	91.0, 99.0

- 2 doses of MenABCWY vaccine given 12 months apart elicit higher serogroup B responses
- 98.3-100% of participants had serogroups ABCWY hSBA titers $\geq 1:8$ following 2 doses of MenABCWY vaccine given 12 months apart

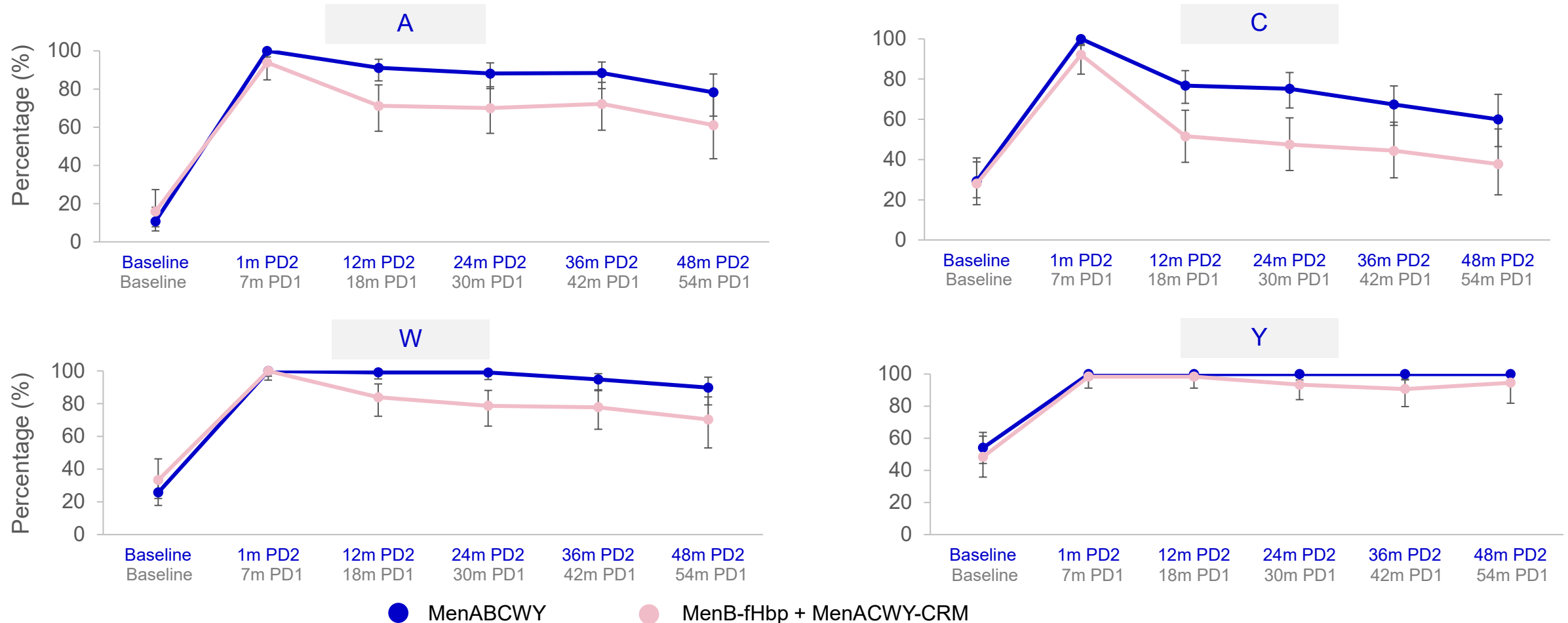
Abbreviations: hSBA=serum bactericidal assay using human complement; MenB=serogroup B.

*For participants with a baseline hSBA titer $<1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $<1:8$ ($<1:16$ for A22), seroresponse is a titer ≥ 4 times the 1:8 (1:16 for A22). For those with a baseline hSBA titer $\geq 1:8$ ($\geq 1:16$ for A22), seroresponse is a titer ≥ 4 times the baseline titer. ^Number of subjects with valid and determinate hSBA titer for the given strain; for study 1001, population includes ACWY-naïve participants for serogroups ACWY. †hSBA titer $\geq 1:8$ (1:16 for A22) for all 4 MenB strains 1 month after Dose 2.

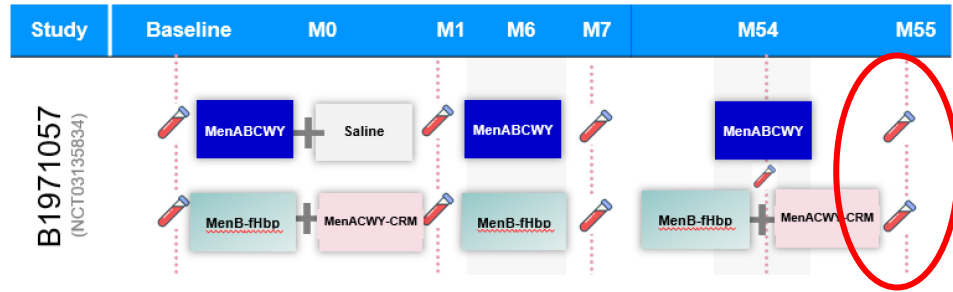
Data on File, Study C3511001 (NCT04440163) and C3511004 (NCT04440176) Aug 2022, Pfizer Inc.

MenACWY seroprotection persists up to 4 years in ACWY-naïve participants

Percentage of individuals* with hSBA titers $\geq 1:8$ at all timepoints



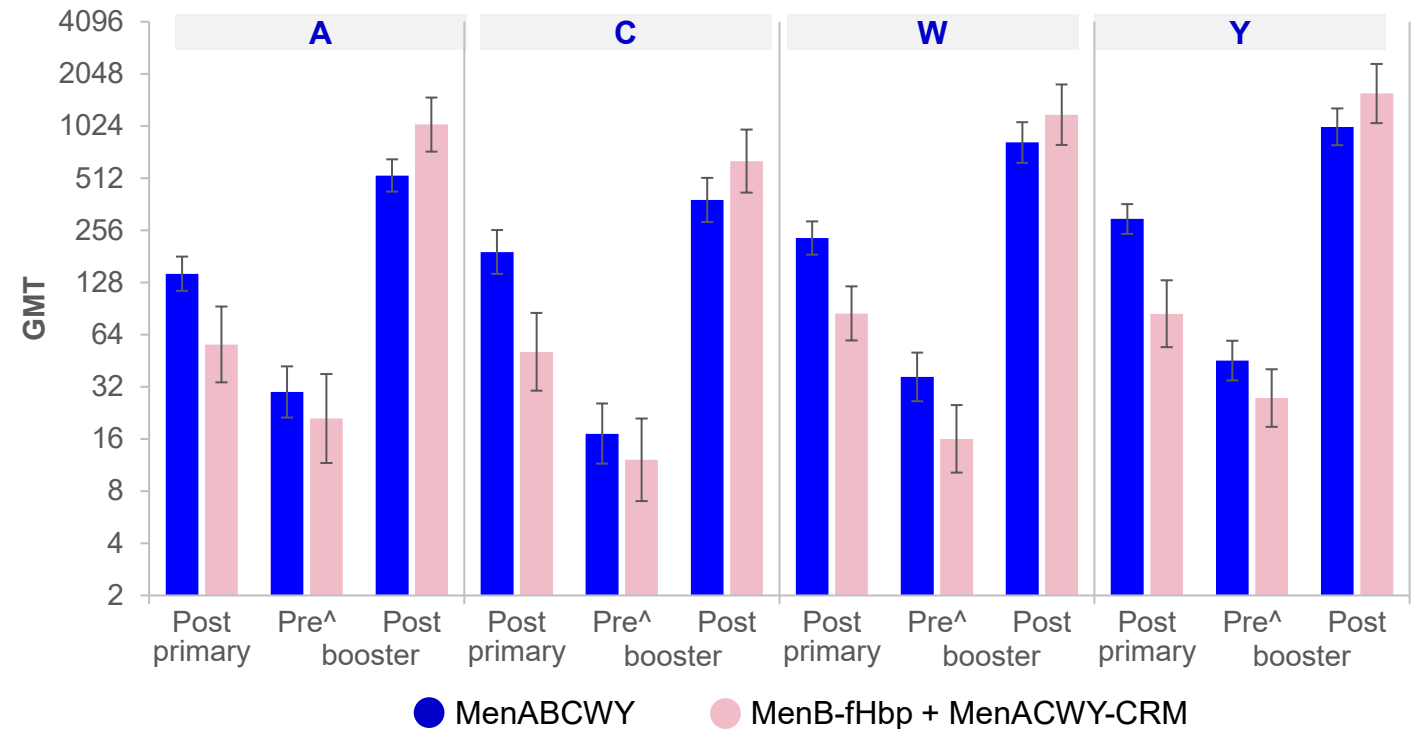
Booster response observed following a dose of MenABCWY vaccine 4 years after a 2 dose primary series (0,6m) in ACWY-naïve participants



Comparisons (ACWY-naïve participants):

- MenABCWY vaccine 4 years[^] after second dose (pre booster) and 1 month after booster
- MenACWY-CRM 4.5 years[^] after single dose (pre booster) and 1 month after booster

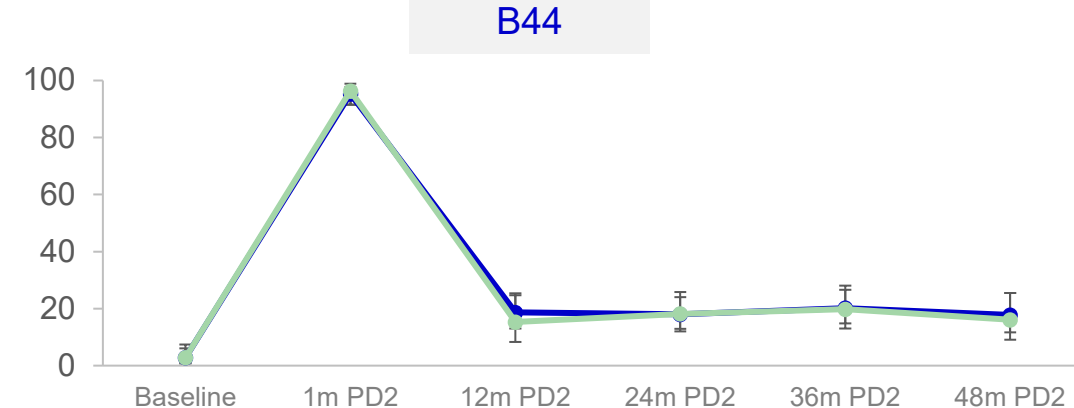
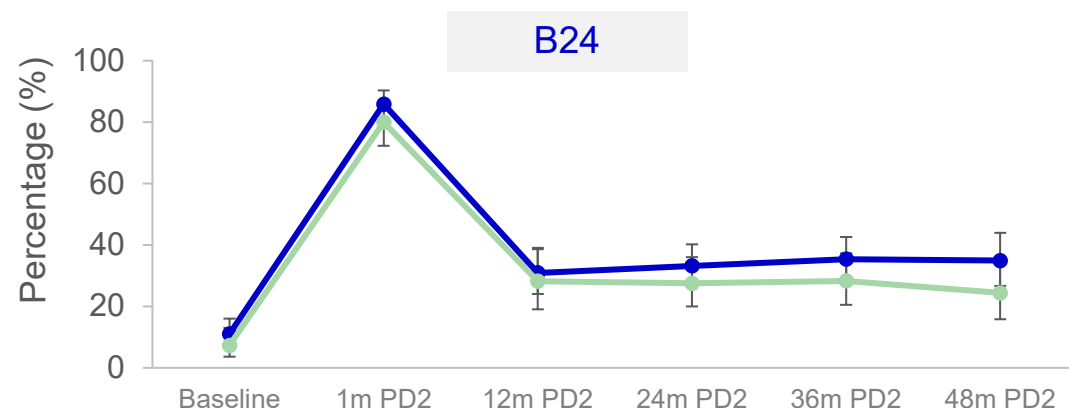
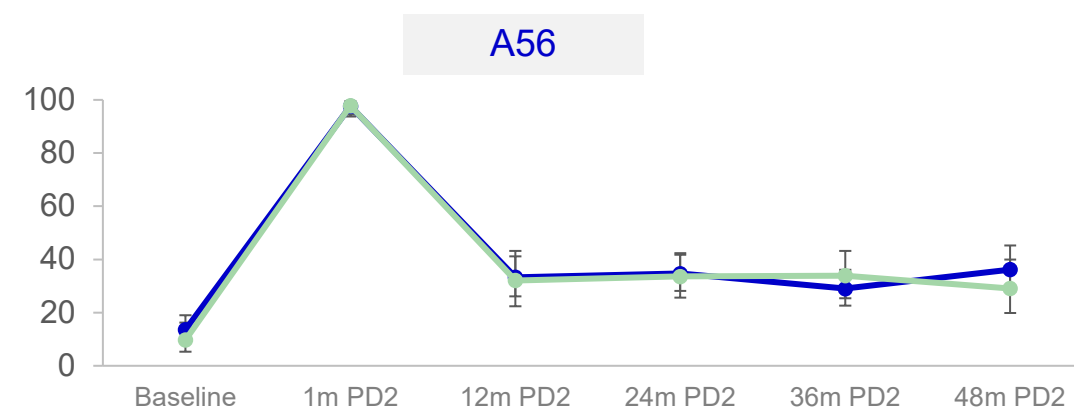
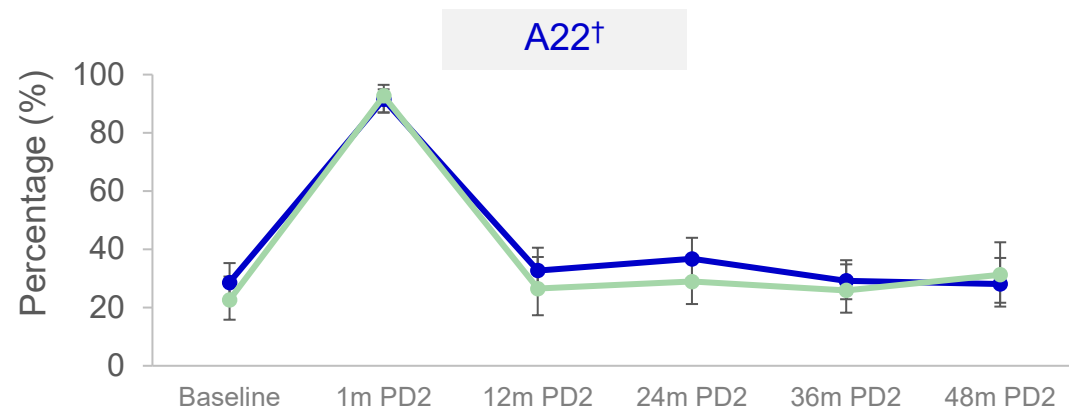
GMTs* 4 years after primary vaccination and 1 month after booster for **serogroups ACWY**



100% of participants had ACWY hSBA titers $\geq 1:8$ following a booster dose of MenABCWY vaccine at 4 years

MenB seroprotection up to 4 years after 2 doses of MenABCWY

Percentage of individuals* with hSBA titers $\geq 1:8^{\dagger}$ at all timepoints



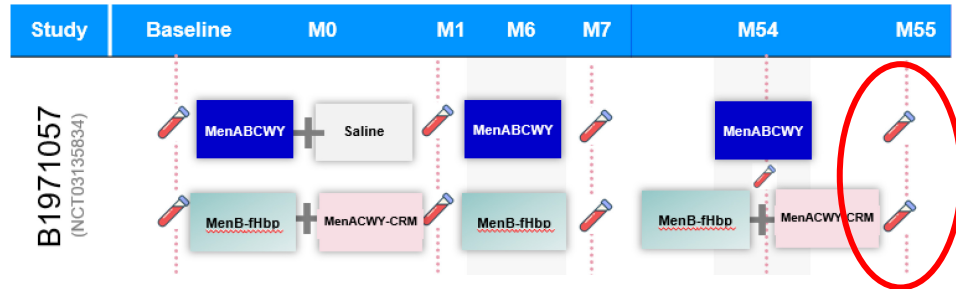
● MenABCWY ● MenB-fHbp + MenACWY-CRM

Abbreviations: hSBA=serum bactericidal assay using human complement; PD2=post dose 2.

*Number of subjects with valid and determinate hSBA titer for the given strain ranged from 162-212 for MenABCWY and 83-137 for MenB-fHbp + MenACWY-CRM (Stage 2 mITT population [baseline through 36m PD2]), and 121-129 for MenABCWY and 81-87 for MenB-fHbp + MenACWY-CRM (Booster evaluable immunogenicity population [48m PD2 Post Primary and Post Booster]).[†]hSBA $\geq 1:16$ for A22.

Data on File, Study B1971057 (NCT03135834) Aug 2022, Pfizer Inc.

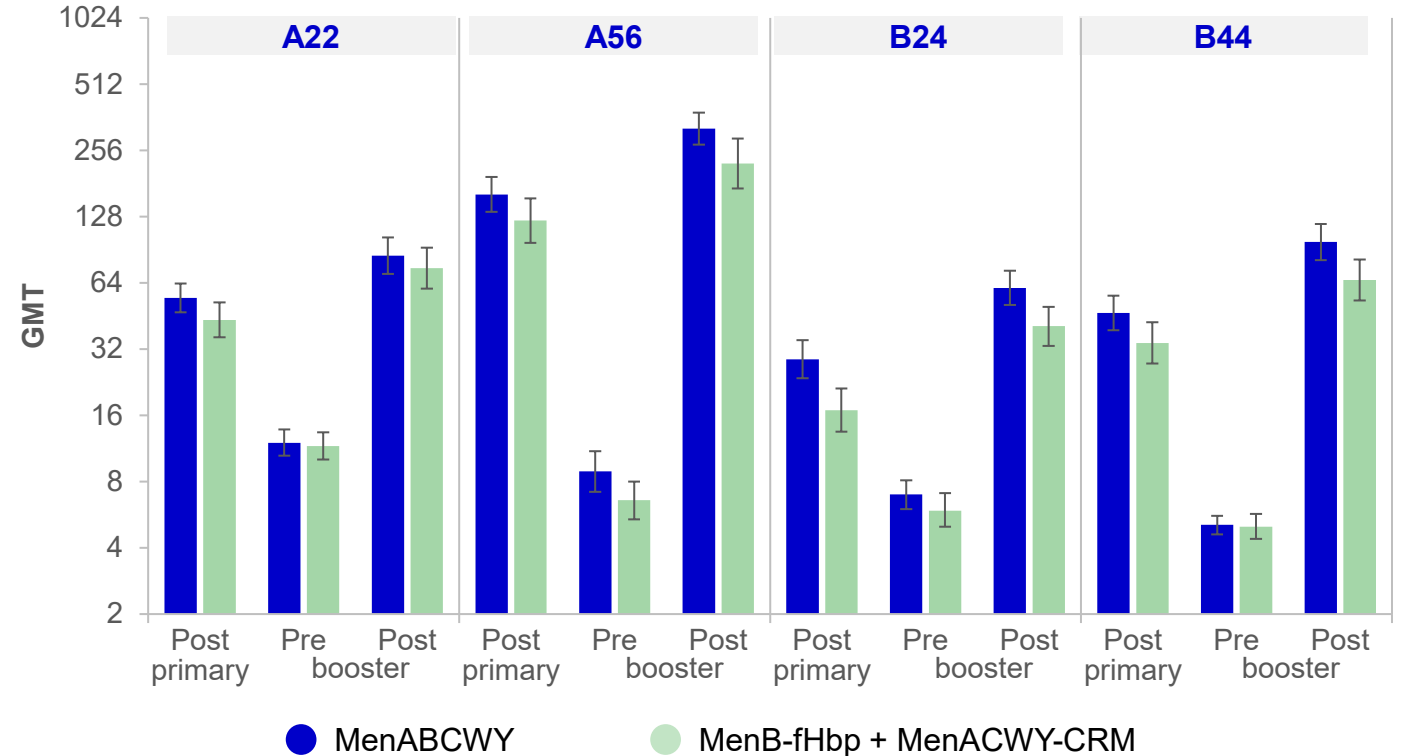
Booster response observed following a dose of MenABCWY vaccine 4 years after a 2 dose primary series (0,6m) in B-naïve participants



Comparisons (B-naïve participants):

- MenABCWY vaccine 4 years after second dose (pre booster) and 1 month after booster
- MenB-fHbp 4 years after second dose (pre booster) and 1 month after booster

GMTs* 4 years after primary vaccination and 1 month after booster for **serogroup B**

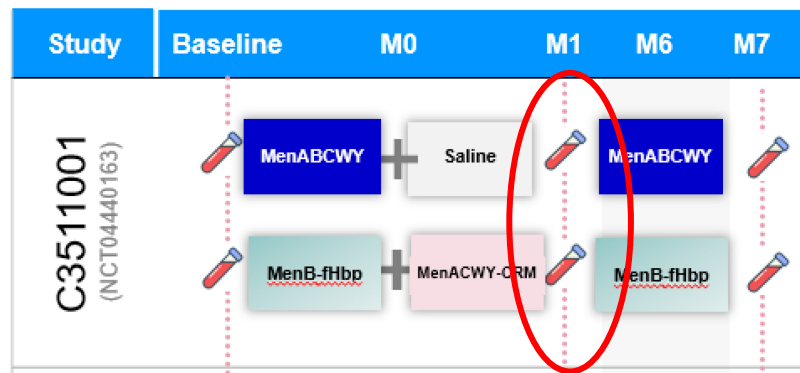


- 95.1-100% of participants had B hSBA titers $\geq 1:8^{\wedge}$ following a booster dose of MenABCWY vaccine 4 years

An abstract, three-dimensional geometric shape composed of several blue, curved, and faceted planes. The shape is positioned on the right side of the slide, extending from the top right towards the bottom right. It has a complex, crystalline appearance with various angles and curves, rendered in different shades of blue to create a sense of depth and volume.

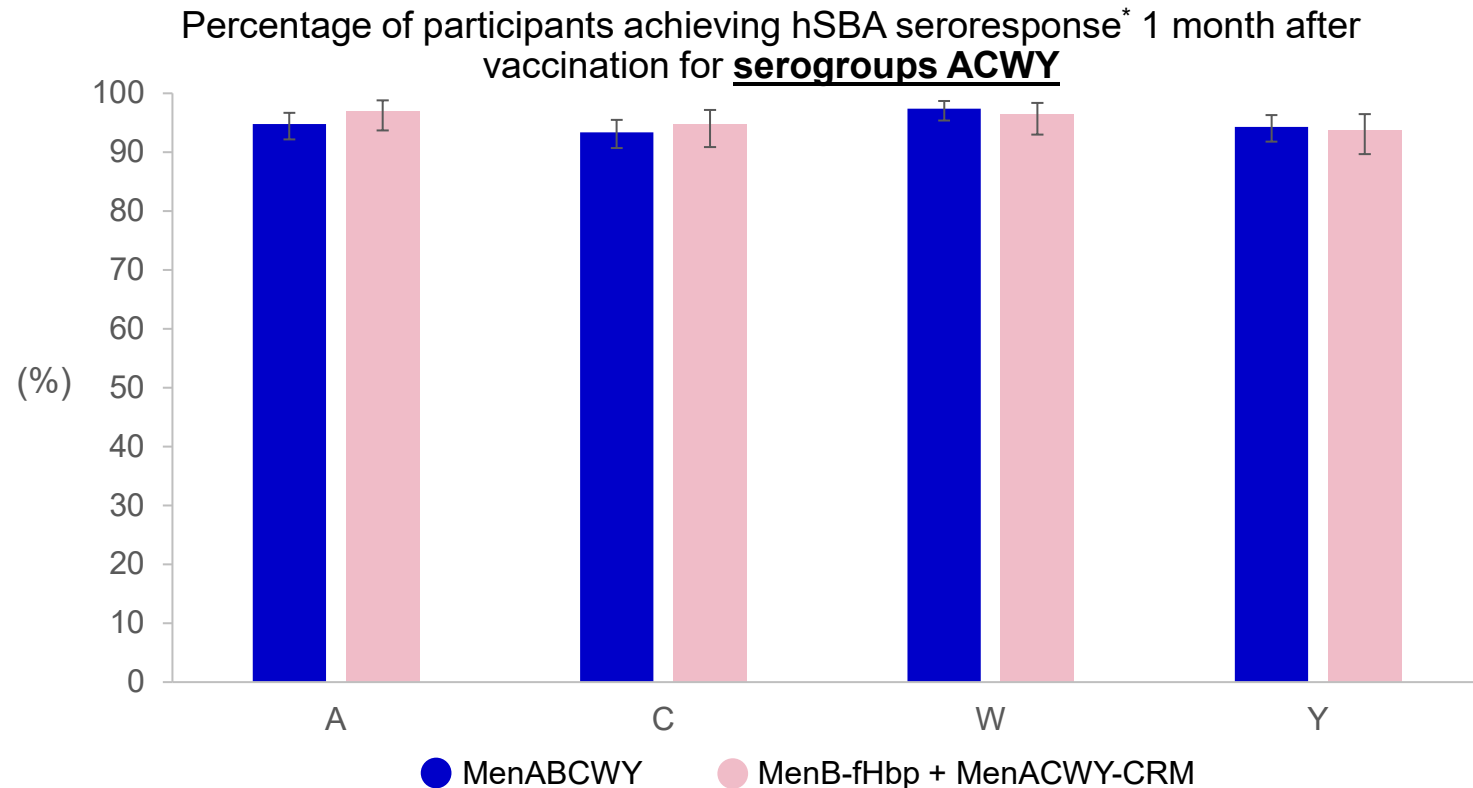
Immunogenicity
ACWY-primed

A single dose of MenABCWY vaccine can be used as an alternative to ACWY vaccines in ACWY-primed adolescents



Comparisons (ACWY-primed participants):

- MenABCWY vaccine 1 month after first dose
- MenACWY-CRM 1 month after single dose



- 1 dose of MenABCWY vaccine was **noninferior** to 1 dose of MenACWY-CRM in ACWY-primed participants
- 99.5-100% of participants had serogroups ACWY hSBA titers $\geq 1:8$ after 1 dose of MenABCWY vaccine

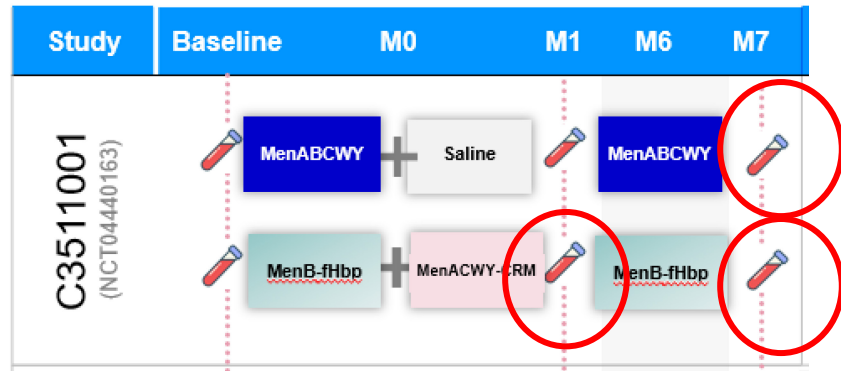
Abbreviations: hSBA=serum bactericidal assay using human complement.

*For participants with a baseline hSBA titer $< 1:4$, seroresponse is defined as a titer $\geq 1:16$. For those with a baseline hSBA titer $\geq 1:4$ and $< 1:8$, seroresponse is a titer ≥ 4 times the 1:8. For those with a baseline hSBA titer $\geq 1:8$, seroresponse is a titer ≥ 4 times the baseline titer.

N=428-442 for MenABCWY group; N=222-227 for MenB-fHbp + MenACWY-CRM group.

Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

2 doses of MenABCWY vaccine can be used as an alternative to 1 dose MenACWY-CRM and 2 doses MenB-fHbp in ACWY-primed adolescents



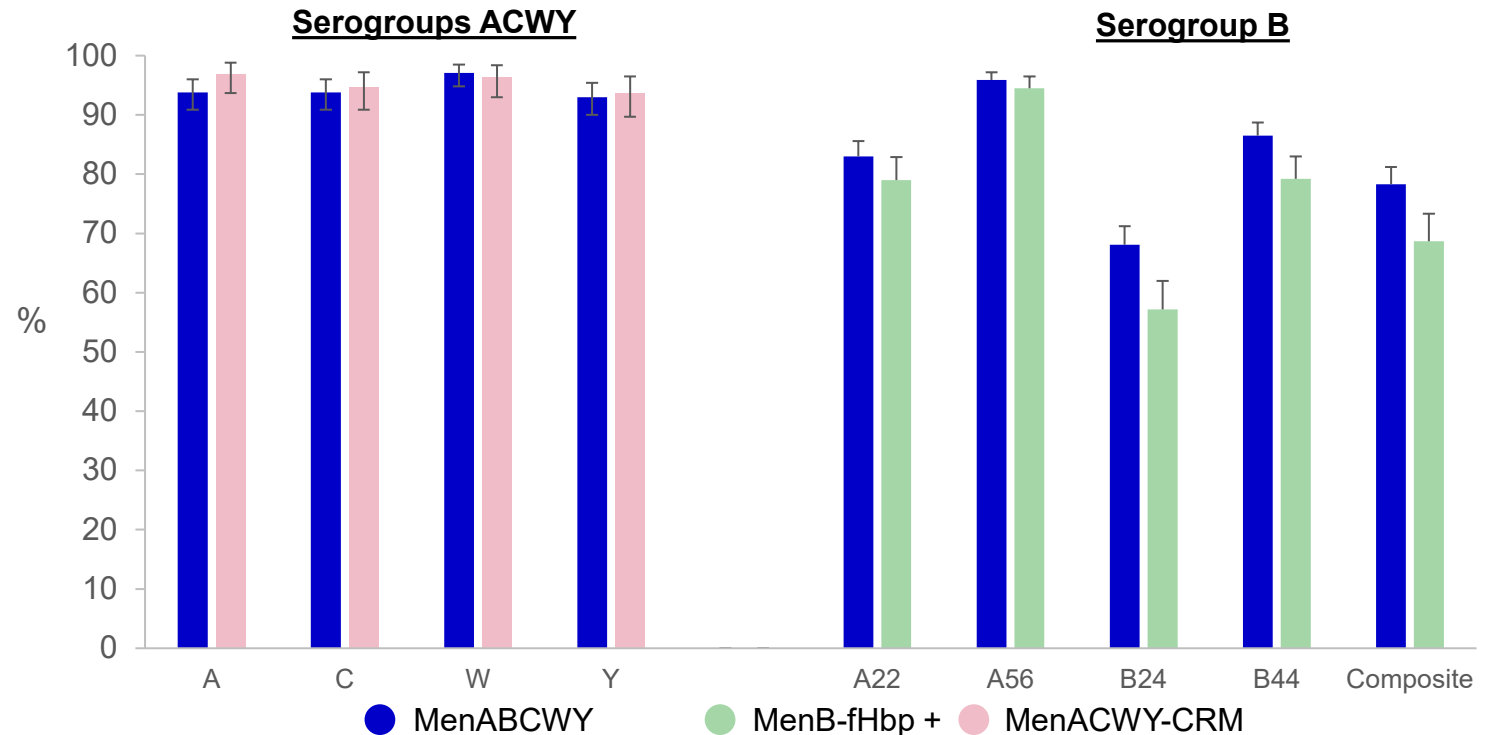
Comparisons (ACWY-primed participants):

- MenABCWY vaccine 1 month after second dose
- MenACWY-CRM 1 month after single dose

Comparisons (All participants group B vaccine naive):

- MenABCWY vaccine 1 month after second dose
- MenB-fHbp 1 month after second dose

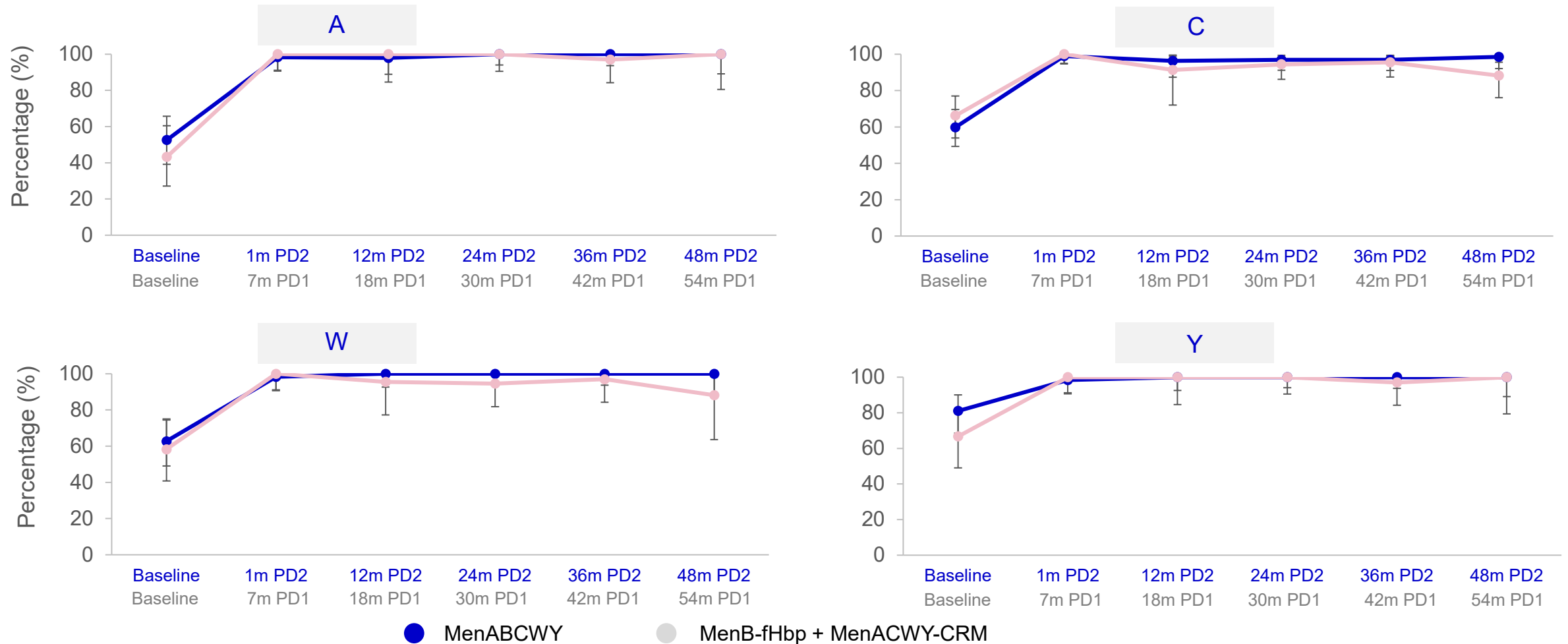
Percentage of participants achieving hSBA seroresponse* 1 month after vaccination



- 2 doses of MenABCWY vaccine were **noninferior** to 1 dose of MenACWY-CRM in ACWY-primed participants
 - 99-100% had serogroups ACWY hSBA titers $\geq 1:8$ after 2 doses of MenABCWY vaccine
- 100% of ACWY-primed participants have protective titers four years after 2 doses of MenABCWY vaccine (Study B1971057)

MenACWY seroprotection persists up to 4 years in ACWY-primed population

Percentage of participants* (95% CI) with hSBA titers $\geq 1:8$



Abbreviations: hSBA=serum bactericidal assay using human complement; PB=post booster; PD1=post dose 1; PD2=post dose 2.

*Number of subjects with valid and determinate hSBA titer for the given strain. Lower N for groups A, W, Y compared to C due to receipt of monovalent C vaccine prior to study entry.

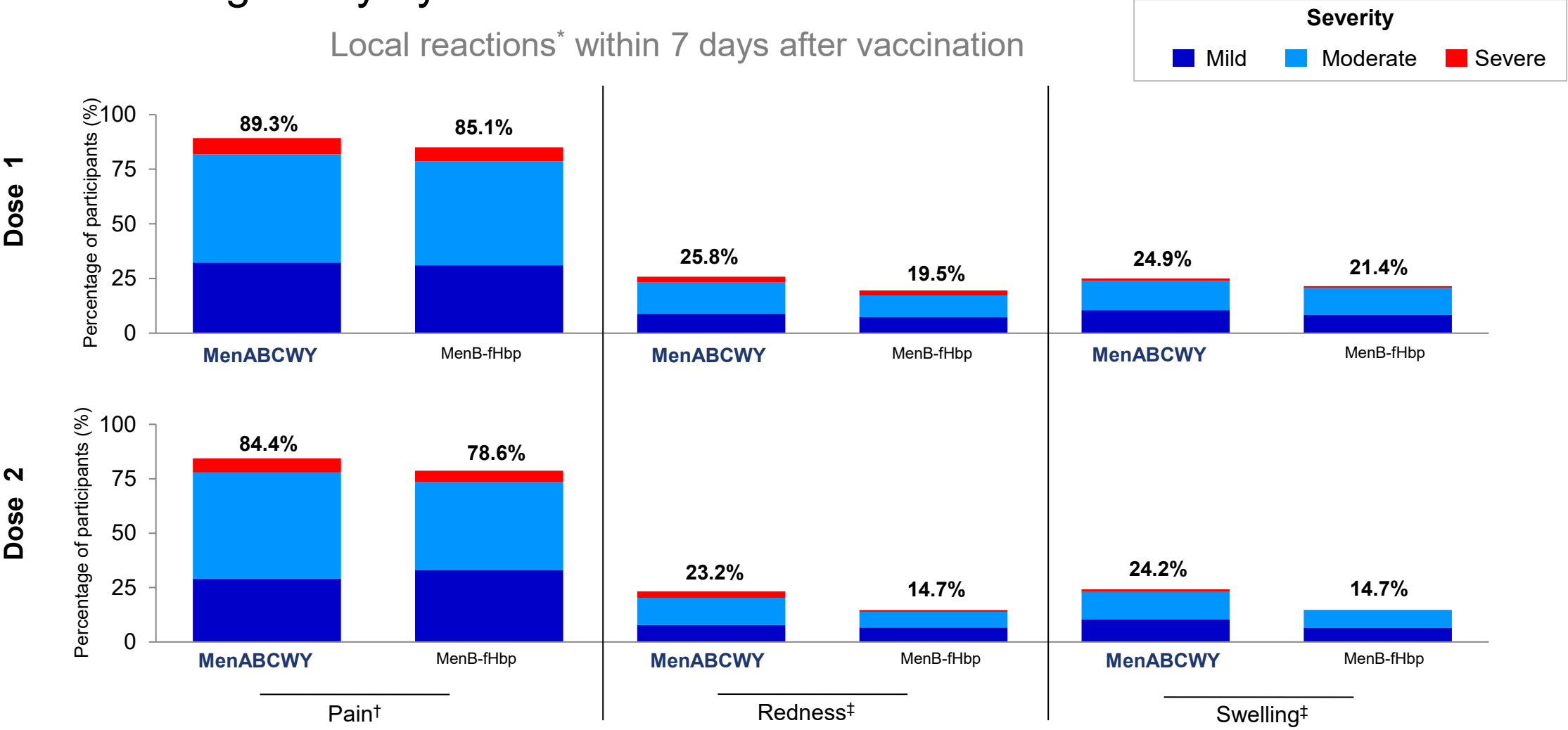
For groups A, W, and Y, N=48-61 for MenABCWY and 22-38 for MenB-fHbp + MenACWY-CRM (Stage 2 mITT population [baseline through 36m PD2/42m PD1]), and 32-33 for MenABCWY and 16-17 for MenB-fHbp + MenACWY-CRM (Booster evaluable immunogenicity population [48m PD2 /54m PD1 Post Primary and Post Booster]). For group C, N=54-100 for MenABCWY and 23-72 for MenB-fHbp + MenACWY-CRM (Stage 2 mITT population), and 68-70 for MenABCWY and 51 for MenB-fHbp + MenACWY-CRM (Booster evaluable immunogenicity population).

Data on File, Study B1971057 (NCT03135834) Aug 2022, Pfizer Inc.

Safety

Local reactogenicity by dose

Local reactions* within 7 days after vaccination



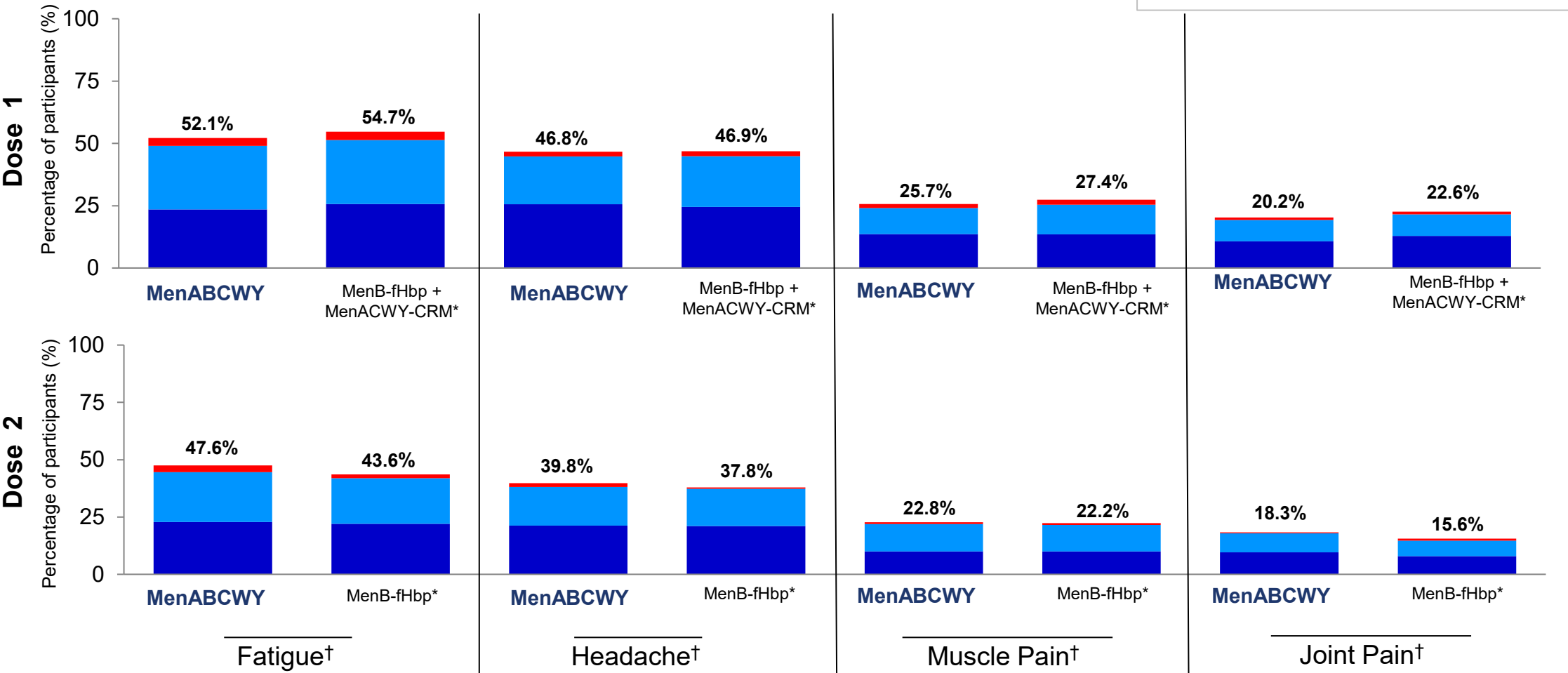
No differences observed between: ACWY-Naïve and Primed participants or Primary and Booster vaccination



*Local reactions are summarized only for the left arm, which is the MenABCWY vaccine or MenB+fHbp injection site; †Mild=does not interfere with activity, moderate=interferes with activity, severe=prevents daily activity.
‡Mild=>2.0 to 5.0 cm, moderate=>5.0 to 10.0 cm, and severe is >10.0 cm.
Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

Systemic reactogenicity by dose

Systemic events within 7 days after vaccination



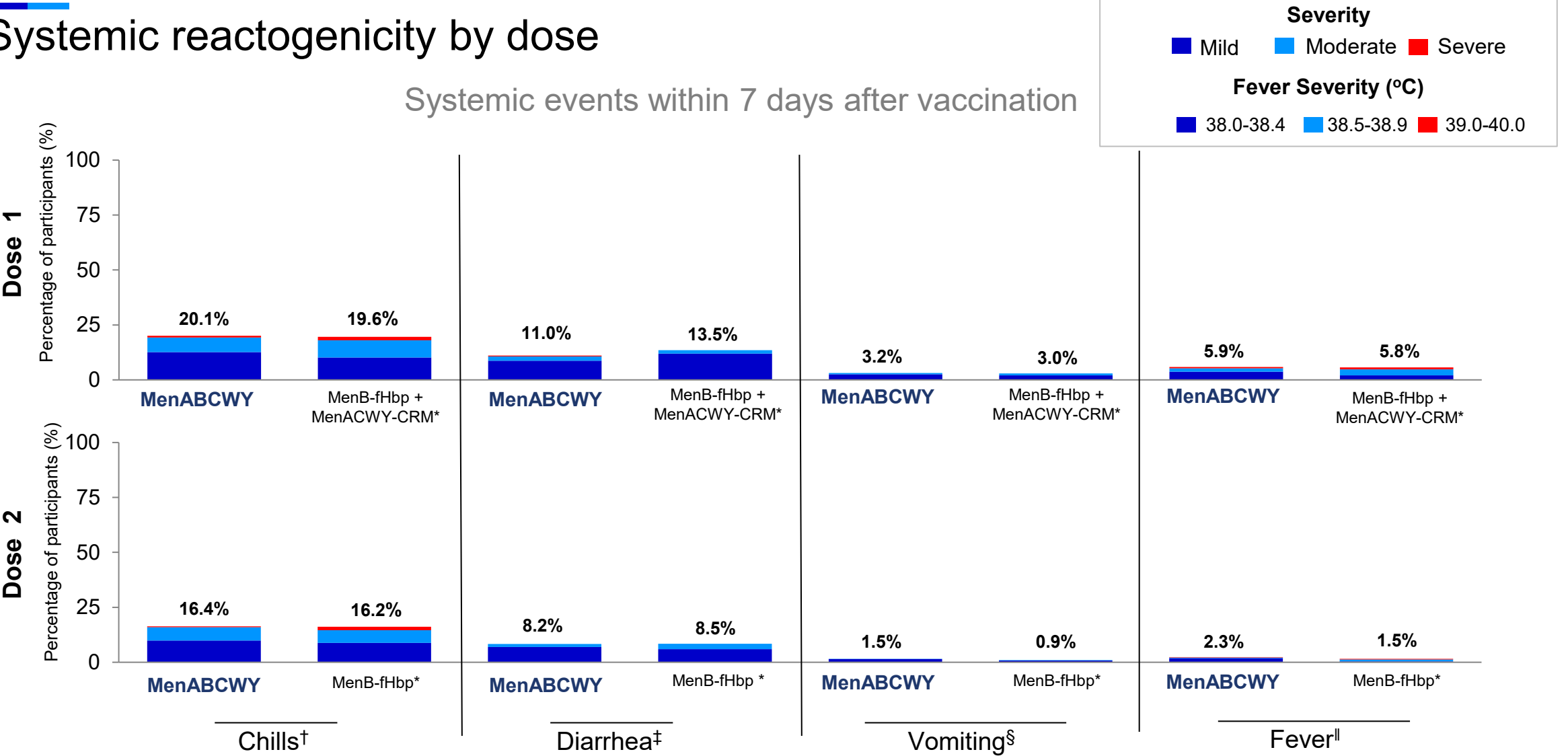
No differences observed between: ACWY-Naïve and Primed participants or Primary and Booster vaccination



*MenB-fHbp + MenACWY-CRM group: MenB-fHbp and MenACWY-CRM given at dose 1 and 3, MenB-fHbp given at dose 2.
†Mild: does not interfere with activity; Moderate: some interference with activity; Severe: prevents daily routine activity.
Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

Systemic reactogenicity by dose

Systemic events within 7 days after vaccination



No differences observed between: ACWY-Naïve and Primed participants or Primary and Booster vaccination



*MenB-fHbp + MenACWY-CRM group: MenB-fHbp and MenACWY-CRM given at dose 1 and 3, MenB-fHbp given at dose 2. †Mild: does not interfere with activity; Moderate: some interference with activity; Severe: prevents daily routine activity. ‡Mild: 2–3 loose stools in 24 hours; Moderate: 4–5 loose stools in 24 hours; Severe: 6 or more loose stools in 24 hours. §Mild: 1–2 times in 24 hours; Moderate: >2 times in 24 hours; Severe: requires intravenous hydration. ||No fevers >40 °C were reported. Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

Number (%) of participants reporting ≥ 1 adverse event during the vaccination phase*

Endpoint	MenABCWY + Saline N=1763				MenB-fHbp + MenACWY-CRM N=649			
	n	%	(95% CI)	Number of Events	n	%	(95% CI)	Number of Events
All AEs	368	20.9	(19.0, 22.8)	638	132	20.3	(17.3, 23.6)	202
Related	11	0.6	(0.3, 1.1)	19	4	0.6	(0.2, 1.6)	5
Severe	13	0.7	(0.4, 1.3)	17	4	0.6	(0.2, 1.6)	4
All SAEs	7	0.4	(0.2, 0.8)	9	0	0	(0.0, 0.6)	0
Related	0	0	(0.0, 0.2)	0	0	0	(0.0, 0.6)	0
All MAEs	263	14.9	(13.3, 16.7)	436	93	14.3	(11.7, 17.3)	141
Related	2	0.1	(0.0, 0.4)	2	1	0.2	(0.0, 0.9)	1
Severe	8	0.5	(0.2, 0.9)	9	3	0.5	(0.1, 1.3)	3
All NDCMCs	20	1.1	(0.7, 1.7)	23	2	0.3	(0.0, 1.1)	2
Related	0	0	(0.0, 0.2)	0	0	0	(0.0, 0.6)	0
Severe	1	<0.1	(0.0, 0.3)	2	0	0	(0.0, 0.6)	0

Higher number of NDCMCs of ADHD in the MenABCWY group – most of them with ADHD-related symptoms before entering the study

Abbreviations: AE=adverse event; MAE=medically attended event (nonserious AE that results in an evaluation at a medical facility); NDCMC=newly diagnosed chronic medical condition (a disease or medical condition, not previously identified, that is expected to be persistent or is otherwise long-lasting in its effects); SAE=serious adverse event.
*Vaccination phase refers to the time from the first study vaccination (Visit 1) through 1 month after the second study vaccination (Visit 4).

Data on File, Study C3511001 (NCT04440163) Aug 2022, Pfizer Inc.

Overall conclusion: Data support the use of MenABCWY vaccine in the US adolescent meningococcal vaccination platform

Safety

- MenABCWY vaccine was safe and well tolerated in adolescents and young adults

ACWY protection

- A single dose of MenABCWY vaccine can be used as an alternative to ACWY vaccines in ACWY-naïve or primed adolescents and young adults

ABCWY protection

- MenABCWY vaccine protects against all 5 serogroups with 2 doses given 6 to 12 months apart
- Booster response was observed following a dose of MenABCWY vaccine 4 years after a 2 dose primary series (0,6m) for all 5 serogroups
- If 2 doses of MenABCWY vaccine are administered at 11-12 yrs of age, data support that a single (booster) dose from 16 years of age can provide protection against all 5 serogroups



Acknowledgements

Pfizer wishes to thank:

- The clinical trial participants
- Sites, investigators, CRO, our partners, and their staff