

Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

Janssen Pharmaceutical Companies
of Johnson & Johnson

US Centers for Disease Control and Prevention
Advisory Committee on Immunization Practices

February 28, 2021

Introduction

Macaya Douoguih, MD, MPH

Head of Clinical Development and Medical Affairs

Janssen Pharmaceuticals Companies of Johnson & Johnson



Janssen's Vaccine Candidate (Ad26.COV2.S) Supports Global Effort to Fight COVID-19

- Phase 3 study enrolled > 44,000 participants and was conducted during height of pandemic
- Offers substantial protection, especially against severe COVID-19 including hospitalization and death, irrespective of variant
- Well-tolerated and safe
- Single-dose regimen with storage, transportation conditions compatible within existing distribution channels

Key Efficacy Findings from Ad26.COVS Single-Dose Study Demonstrate Protection Against Symptomatic COVID-19



85% vaccine efficacy* against severe COVID-19 globally, including the United States

- Consistent vaccine efficacy against severe disease across all regions
- Equally high protection in South Africa (n > 6,500) where B.1.351 is highly prevalent (> 95%)
- Complete protection against COVID-19 related hospitalizations as of day 28 and no COVID-19 related deaths in the Ad26 group compared to 5 in the placebo group



72% vaccine efficacy* against moderate to severe/critical COVID-19 in the United States

- Participants reflected diversity of US population (n > 19,000)



66% vaccine efficacy* against moderate to severe/critical COVID-19 across all countries

- Protection as of 2 weeks after vaccination



Similar vaccine efficacy demonstrated by age, comorbidities status, sex, race, and ethnicity

Vaccine Efficacy (VE) Results Support Protection Against Emerging Variants

- COV3001 site locations
- Countries with emerging variants

Trial conducted in areas where COVID-19 incidence was highest and where variants were emerging

86% VE
severe/
critical

United States

% variant
96% D614G
3% CAL.20C

88% VE
severe/
critical

Brazil

% variant
69% P.2 lineage
31% D614G

South Africa

% variant
95% B.1.351 lineage
3% D614G

82% VE
severe/
critical

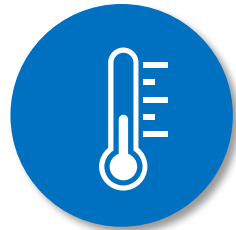
Logistical, Practical Advantages to Help Simplify Distribution and Expand Vaccine Access of Single Dose Ad26.COVS



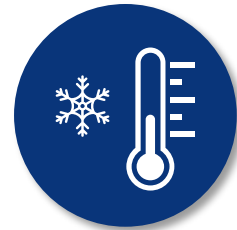
Single, 0.5ml dose offers ability to vaccinate population faster

5 doses per vial

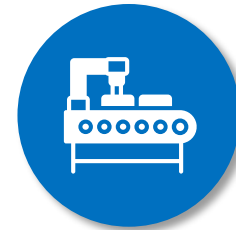
No dilution required



Stored for 3 months at normal refrigerator temperatures, 2° to 8° C (36° to 46° F)



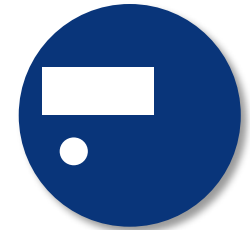
2-year shelf life when frozen, -25° to -15° C (-13° to 5° F)



Prepared for large-scale manufacturing

20 million doses by end of March

100 million doses to US in first half of 2021



Shipping fits into existing supply chain infrastructure

Substantial Experience with Adenovirus 26-based Vaccines

Substantial clinical experience with Ad26-based vaccines (N > 193,000)

- Across continents
- Healthy adults
- Elderly > 65 years
- Breastfeeding, pregnant women within Ebola program
- Various races, ethnicities
- Infants \geq 4 months
- People with HIV

Regular database reviews show good tolerability, safety

- Local, systemic reactogenicity in line with other licensed vaccines
- Database searches for AESIs revealed no safety signals

Comprehensive Development Program

Key Studies

**Preclinical
Animal Studies**

**Including non-human primate (NHP) studies
Immunogenicity, efficacy**

**Phase 1/2a
COV1001**

**First in Human (FIH) study
Safety, immunogenicity, and dose selection**

**Phase 2
COV2001**

**Lower dosing and different intervals
Safety, immunogenicity in adolescents and adults**

**Phase 3
COV3001
(ENSEMBLE)**

**Focus of EUA, single-dose pivotal study
Efficacy, safety, and immunogenicity**

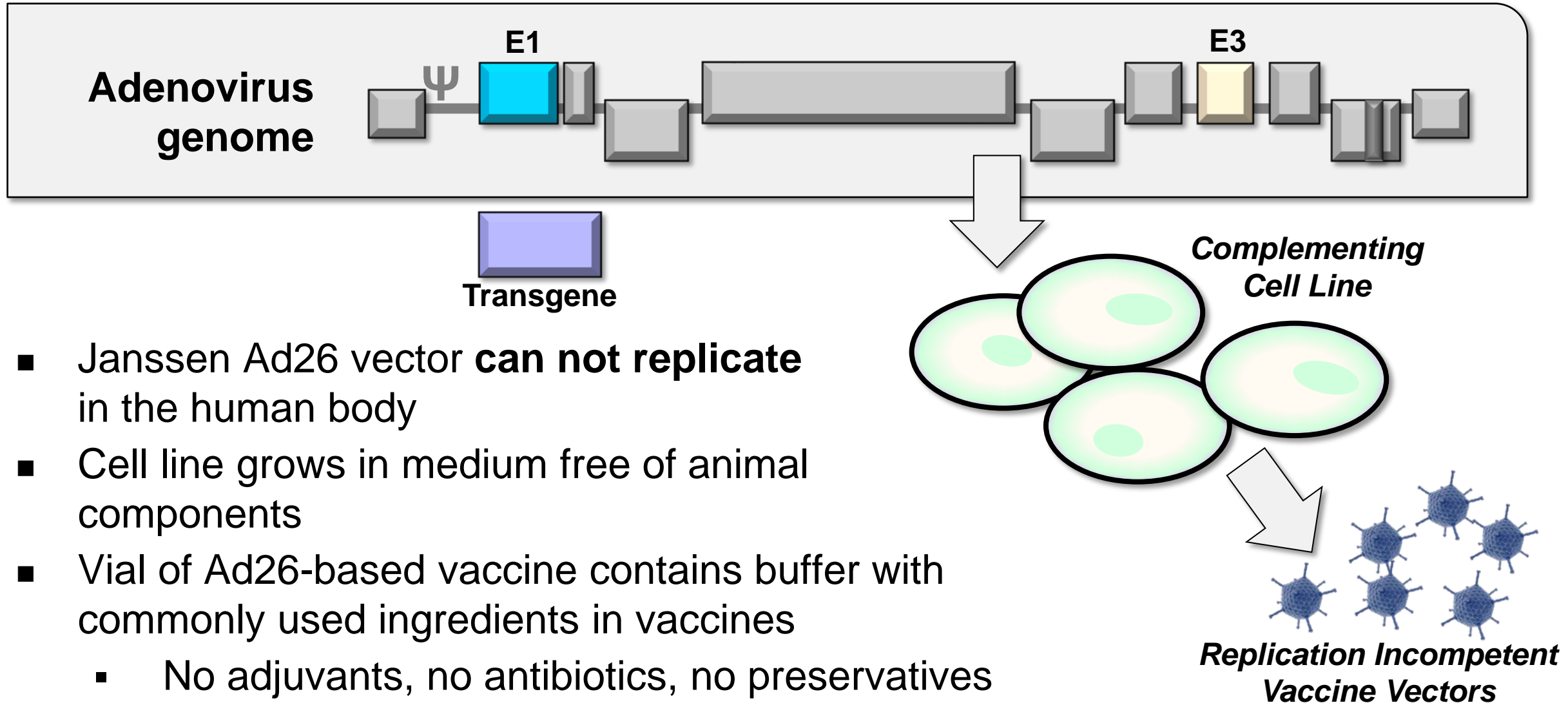
Additional Key Studies

- COV3009: two-dose regimen Phase 3 efficacy study
 - Results estimated to be available late this year
- Immunogenicity and safety studies in children, 0 – 17 years
 - Adolescent study will open enrollment soon
- Pregnant women
 - Planned to begin late March/early April 2021
- Immunocompromised individuals
 - Planned to begin Q3 2021
- Post-authorization observational studies
 - Including pregnancy exposure registry



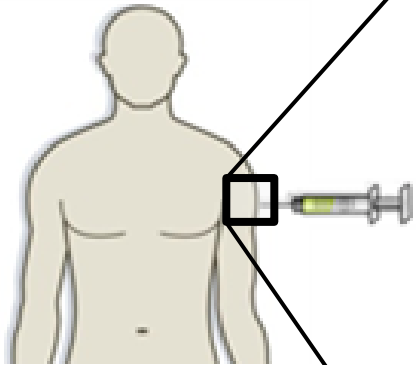
Vaccine Design and Immunogenicity

Ad26 Vector is Replication Incompetent

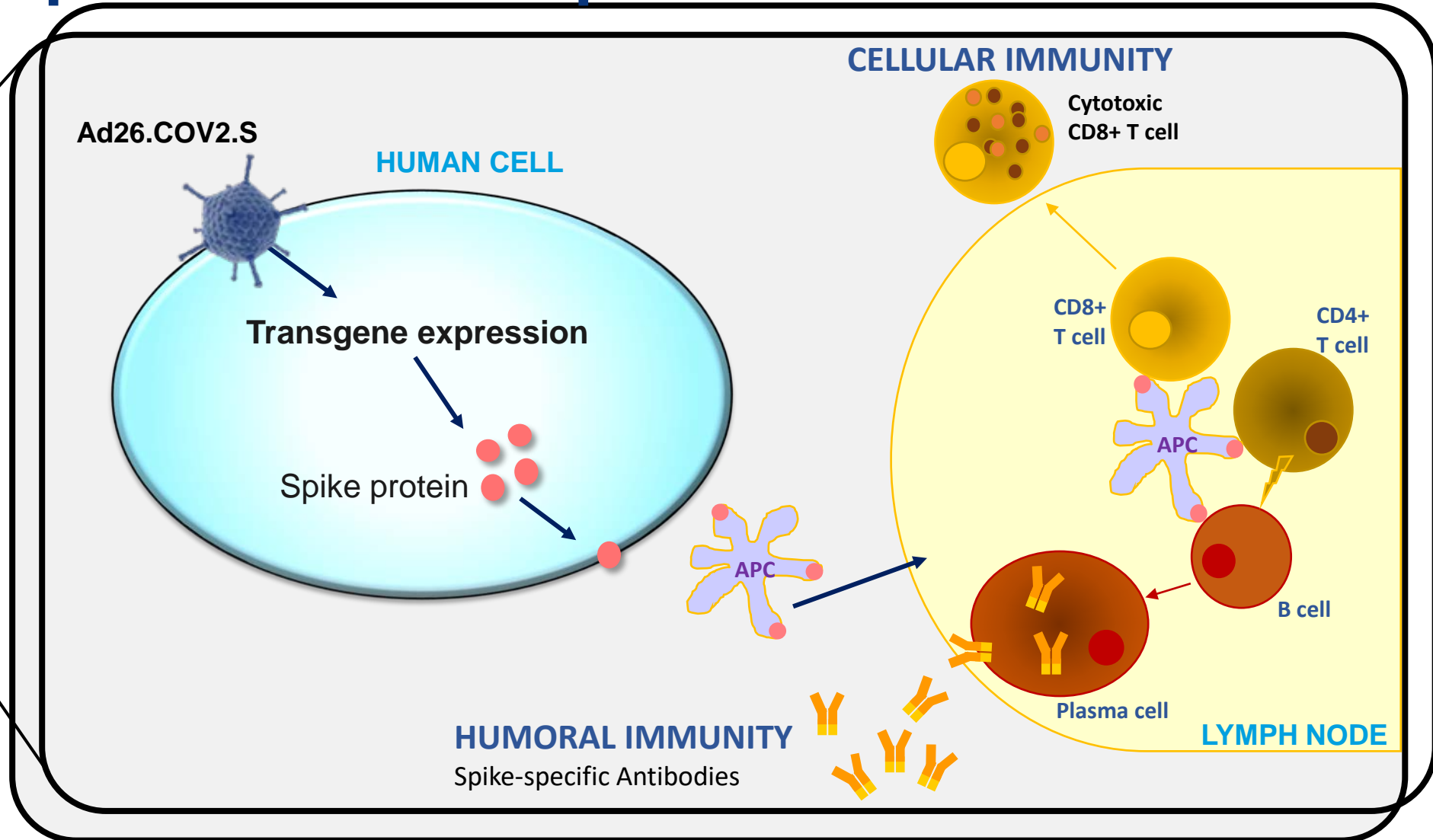


Ad26.COVS.S Expresses SARS-CoV-2 Spike Protein, Eliciting Multiple Immune Responses

I.M.
injection of
Ad26.COVS.S



Adenoviral
vectors
classified as
non-integrating*



*FDA Guidance, 2020

Single-Dose Ad26.COV2.S Fully Protects Against SARS-CoV-2 Challenge in Non-Human Primates (NHP)

- Protection against viral replication
 - Near complete protection in nose
 - Full protection in lung
 - Durability > 6 months
 - Protection seen even with 4-fold lower vaccine dose
 - Nearly full protection in aged NHP
 - Protection in Syrian golden hamsters, no VAED
- Results met FDA criteria to progress to human clinical trials

Summary of Phase 1/2 Immunogenicity Data Following Single Dose of Ad26.COVS.S

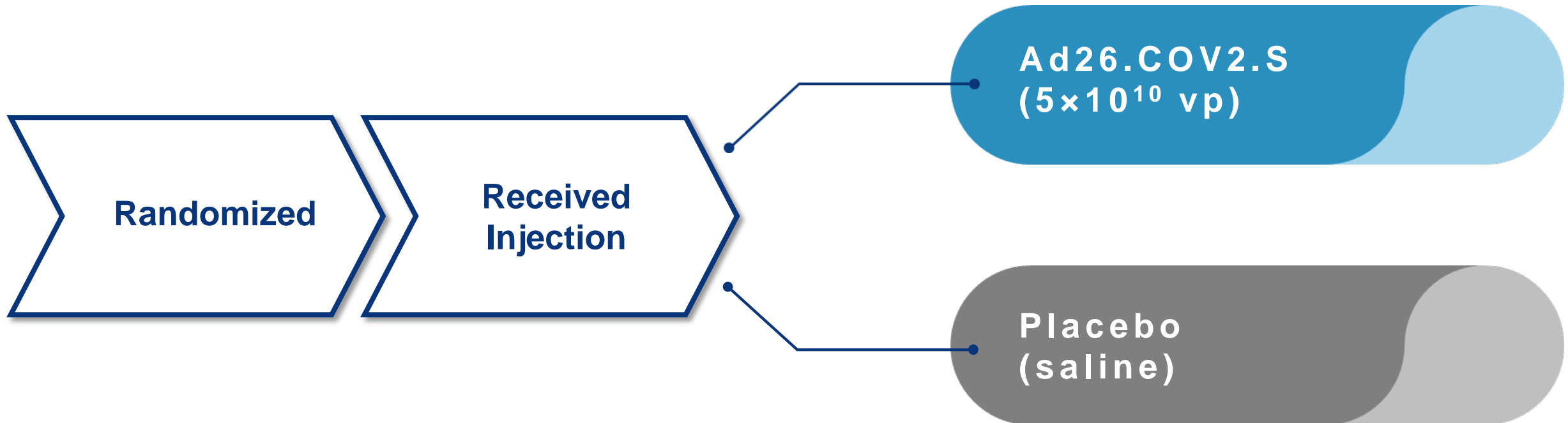
- Neutralizing antibody titers elicited in 96% of adults, independent of age
 - Titers detected as early as 14 days post vaccination
 - Increased to Day 57 and maintained thereafter
- Strong CD8+ and Th1 dominated CD4+ T cell responses
 - Minimizes risk for vaccine associated enhanced disease (VAED)
- Both doses had favorable safety profile
 - Lower dose more favorable reactogenicity profile
- Ad26.COVS.S 5×10^{10} vp dose selected for COV3001



Phase 3 Study COV3001 (ENSEMBLE) Efficacy and Safety

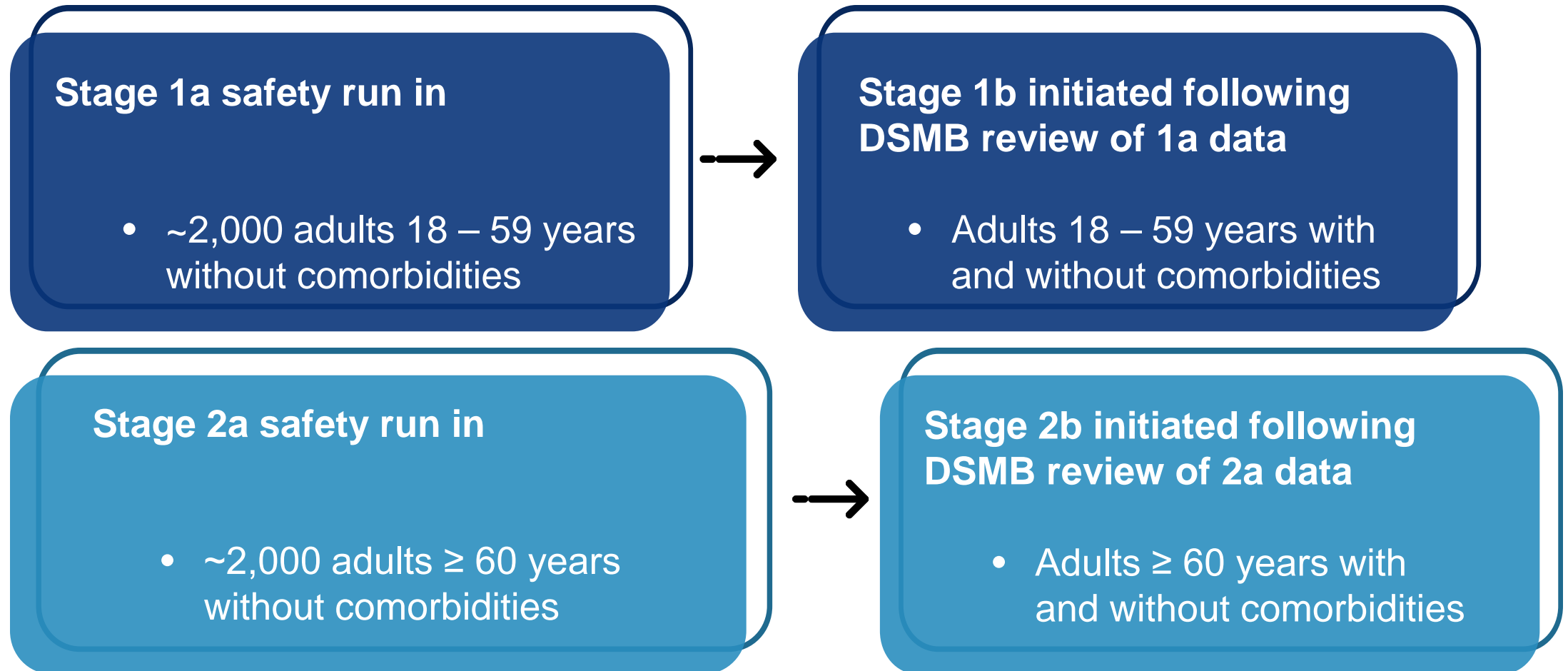
COV3001: Randomized, Double-Blind, Phase 3 Trial

- Evaluating efficacy, safety, immunogenicity of single dose of Ad26.COVS.2.S



- Randomization stratified by site, age group, and absence / presence of comorbidities

COV3001: Began Enrollment with Safety Run-in Phase



Study targeted at least 30% of total study population to be ≥ 60 years

COV3001: Co-Primary Endpoints

Vaccine efficacy to prevent moderate to severe/critical COVID-19



at least 14 days after vaccination



at least 28 days after vaccination

- **Primary Hypothesis: lower limit of 95% confidence interval > 30%**

COV3001: Case Definition for Moderate COVID-19

RT-PCR or molecular test confirmation of SARS-CoV-2 infection

AND

At any time during observation period:

≥ 1 new or worsening sign or symptom

- Respiratory rate ≥ 20 bpm
- Abnormal oxygen saturation ($> 93\%$ on room air)
- Evidence of pneumonia
- Deep vein thrombosis (DVT)
- Shortness of breath

OR

≥ 2 new or worsening sign or symptoms

- Fever
- Heart rate ≥ 90 bpm
- Shaking chills
- Muscle pain
- Changes to olfaction or taste
- Gastrointestinal symptoms
- Red or bruised feet or toes
- Malaise
- Headache
- Cough
- Sore throat

COV3001: Case Definition for Severe/Critical COVID-19

RT-PCR or molecular test confirmation of SARS-CoV-2 infection

AND

At any time during observation period:

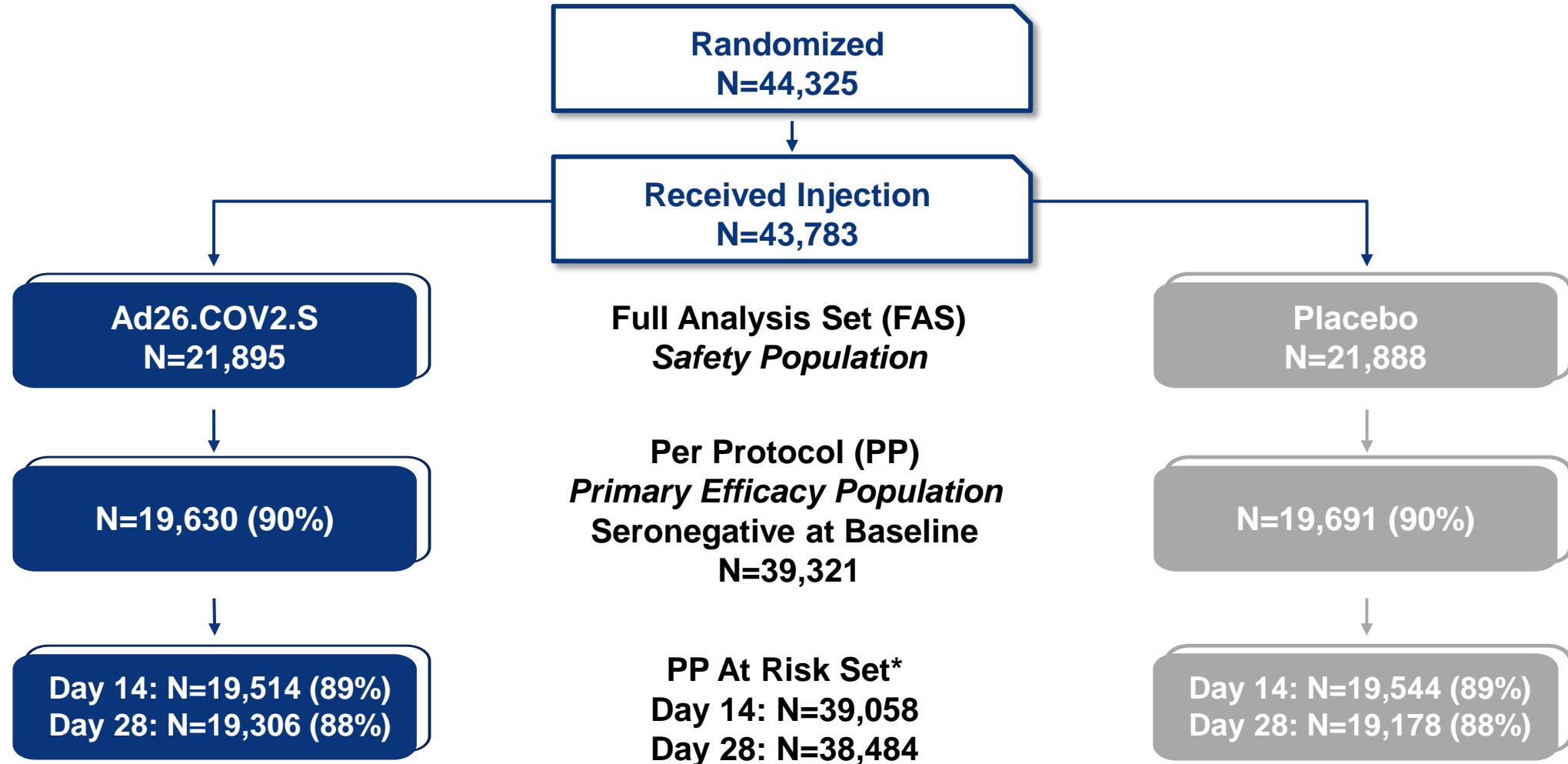
≥ 1 of these signs or symptoms

- **Clinical signs indicative of severe systemic illness:** Respiratory rate ≥ 30 bpm, heart rate ≥ 125 bpm, $SpO_2 \leq 93\%$ on room air at sea level or $PaO_2/FiO_2 < 300$ mmHg
- **Respiratory failure:** Needing high-flow oxygen, non-invasive ventilation, mechanical ventilation, or extracorporeal membrane oxygenation [ECMO]
- **Evidence of shock:** Systolic blood pressure < 90 mmHg, diastolic blood pressure < 60 mmHg, or requiring vasopressors
- **Significant acute renal, hepatic, or neurologic dysfunction**
- **Admission to ICU**
- **Death**



Study COV3001: Disposition and Efficacy Results

COV3001 Disposition of Participants



*PP At Risk set: excluded participants with positive polymerase chain reaction (PCR) test for SARS-CoV-2 between vaccination and day of efficacy assessment

COV3001: No Relevant Differences at Baseline Between Vaccine and Placebo Groups Globally

<i>Full Analysis Set</i>	Ad26.COV2.S N = 21,895		Placebo N = 21,888	
	n	%	n	%
Sex, female	9,820	45%	9,902	45%
Mean Age (SD), years	50.7 (15.0)		50.7 (15.0)	
Age group				
18-59	14,564	67%	14,547	66%
≥ 60	7,331	33%	7,341	34%
≥ 65	4,259	19%	4,302	20%
≥ 75	809	4%	732	3%
Race				
American Indian or Alaska Native	2,083	10%	2,060	9%
Asian	743	3%	687	3%
Black or African American	4,251	19%	4,264	20%
Native Hawaiian or other Pacific Islander	58	0.3%	48	0.2%
White	12,858	59%	12,838	59%
Multiple, unknown, not reported	1,901	9%	1,989	9%
Ethnicity				
Hispanic or Latino	9,874	45%	9,963	46%

COV3001: Similar Baseline Demographics Between Vaccine and Placebo Groups in US

<i>Full Analysis Set</i>	Ad26.COV2.S N = 9,655		Placebo N = 9,647	
	n	%	n	%
Sex, female	4,292	45%	4,256	44%
Mean Age (SD), years	53.0 (14.7)		53.2 (14.7)	
Age group				
18-59	5,894	61%	5,870	61%
≥ 60	3,761	39%	3,777	39%
≥ 65	2,299	24%	2,369	25%
≥ 75	445	5%	416	4%
Race				
American Indian or Alaska Native	92	1%	95	1%
Asian	655	7%	597	6%
Black or African American	1,246	13%	1,264	13%
Native Hawaiian or other Pacific Islander	47	0.5%	41	0.4%
White	7,104	74%	7,090	74%
Multiple, unknown, not reported	510	5%	558	6%
Ethnicity				
Hispanic or Latino	1,381	14%	1,454	15%

COV3001: Global Participants with Comorbidities Similar Between Vaccine and Placebo Groups

<i>Full Analysis Set</i> Baseline Comorbidity* Category, $\geq 2\%$	Ad26.COVS N = 21,895		Placebo N = 21,888	
	n	%	n	%
≥ 1 risk factor	8,936	40.8%	8,922	40.8%
Obesity ≥ 30 kg/m ²	6,277	28.7%	6,215	28.4%
Hypertension	2,225	10.2%	2,296	10.5%
Type 2 Diabetes Mellitus	1,600	7.3%	1,594	7.3%
Serious heart conditions	497	2.3%	511	2.3%

*Pre-existing medical risk factor for developing severe COVID-19

COV3001: US Participants with Comorbidities Similar Between Vaccine and Placebo Groups

<i>Full Analysis Set</i> Baseline Comorbidity* Category, $\geq 2\%$	Ad26.COV2.S N = 9,655		Placebo N = 9,647	
	n	%	n	%
≥ 1 risk factor	4,227	43.8%	4,247	44.0%
Obesity ≥ 30 kg/m ²	3,085	32.0%	3,054	31.7%
Hypertension	1,139	11.8%	1,166	12.1%
Type 2 Diabetes Mellitus	743	7.7%	729	7.6%
Serious heart conditions	291	3.0%	304	3.2%
Asthma	160	1.7%	203	2.1%

*Pre-existing medical risk factor for developing severe COVID-19

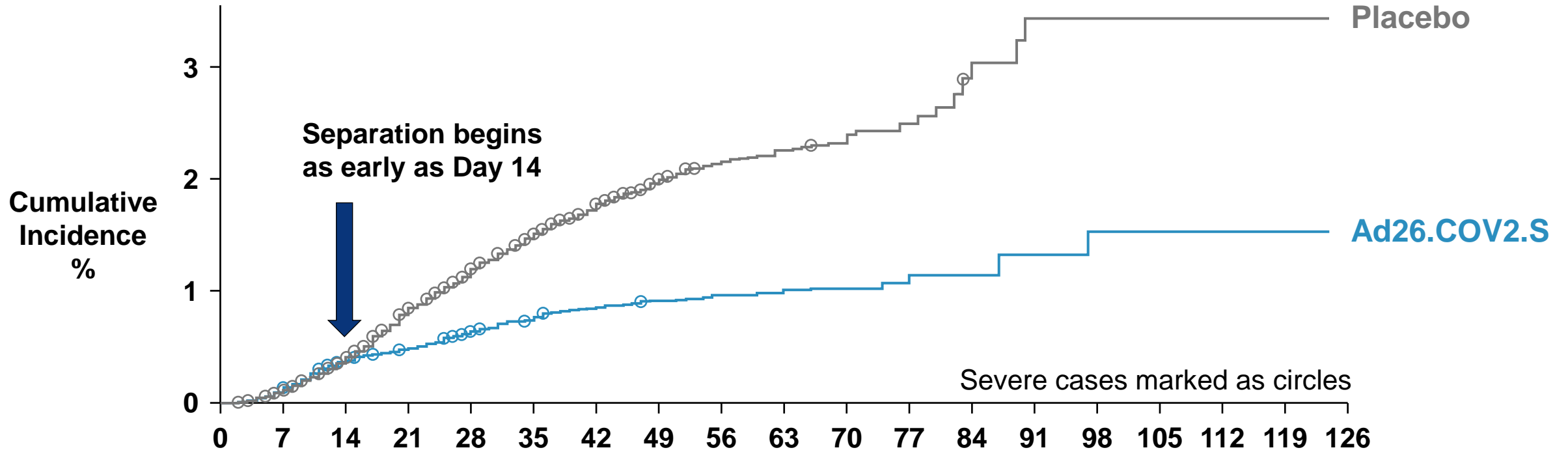
COV3001 Met Co-Primary Endpoints: Ad26.COVS Protects Against Moderate to Severe/Critical COVID-19 Globally

<i>PP At Risk Set</i>	> Day 14		> Day 28	
	Ad26.COVS N = 19,514	Placebo N = 19,544	Ad26.COVS N = 19,306	Placebo N = 19,178
Number of confirmed cases, n	116	348	66	193
Person-years	3,117	3,096	3,102	3,071
Vaccine efficacy (adjusted 95% CI)	66.9% (59.0, 73.4)		66.1% (55.0, 74.8)	

Ad26.COVS Protects Against Moderate to Severe/Critical COVID-19 in US Population

<i>PP At Risk Set</i>	> Day 14		> Day 28	
	Ad26.COVS N = 9,119	Placebo N = 9,086	Ad26.COVS N = 8,958	Placebo N = 8,835
Number of cases, n	51	196	32	112
Person-years	1,414	1,391	1,403	1,376
Vaccine efficacy (95% CI)	74.4% (65.0, 81.6)		72.0% (58.2, 81.7)	

Kaplan Meier Shows Early Onset of Protection Against Moderate to Severe/Critical COVID-19



Participants at risk

Ad26.COVID.S	19744	19725	19669	19642	19612	19578	18541	14909	10930	7831	3998	1468	713	484	483	482	142	31	0
Placebo	19822	19804	19745	19652	19579	19488	18411	14814	10823	7740	3876	1439	708	485	482	480	133	27	0

Cumulative number of cases

Ad26.COVID.S	0	27	76	96	126	151	168	178	184	188	189	191	191	192	193	193	193	193	193
Placebo	0	22	81	168	237	299	351	387	407	416	423	425	430	432	432	432	432	432	432

Use of Larger Dataset Justified

COVID-19 Case Data Set	Cases (N)		Assessment
	> Day 14	> Day 28	
Molecularly (PCR) confirmed by central laboratory (confirmed)	464	259	Co-primary and secondary efficacy analyses
Global vaccine efficacy: moderate to severe/critical COVID-19	66.9%	66.1%	
PCR+ test from any source, regardless of central laboratory confirmation (non-confirmed)	682	437	Subgroup analyses, COVID-19 hospitalizations, COVID-19-related deaths
Global vaccine efficacy: moderate to severe/critical COVID-19	66.3%	65.5%	



High concordance (90%) between COVID-19 case datasets



Vaccine efficacy results differed between data sets by < 1% at both timepoints

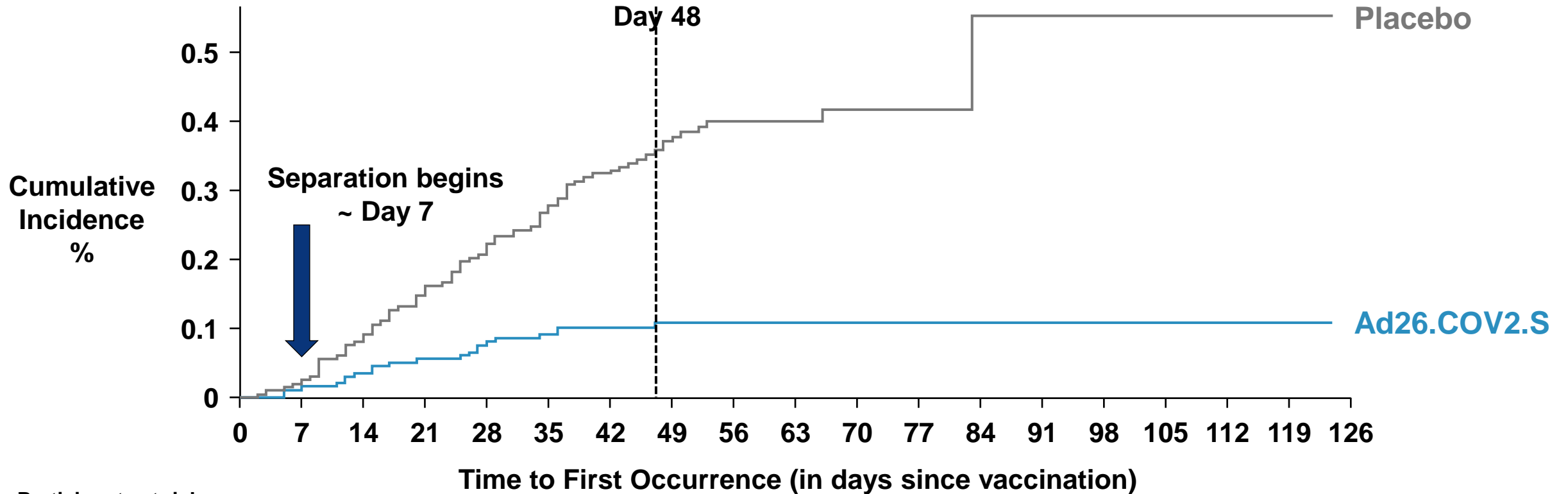
Study COV3001: Key Secondary and Other Endpoints

- Vaccine efficacy against severe/critical COVID-19
- Vaccine impact on hospitalization and prevention of death
- Vaccine impact on asymptomatic/undetected COVID-19

High Vaccine Efficacy Against Severe/Critical COVID-19

	> Day 14		> Day 28	
	Ad26.COVS.S N = 19,514	Placebo N = 19,544	Ad26.COVS.S N = 19,306	Placebo N = 19,178
<i>PP At Risk Set</i>				
Number of confirmed cases, n	14	60	5	34
Vaccine efficacy (adjusted 95% CI)	76.7% (54.6, 89.1)		85.4% (54.2, 96.9)	

Time to First Occurrence of Severe/Critical COVID-19 Demonstrates Early Onset of Protection



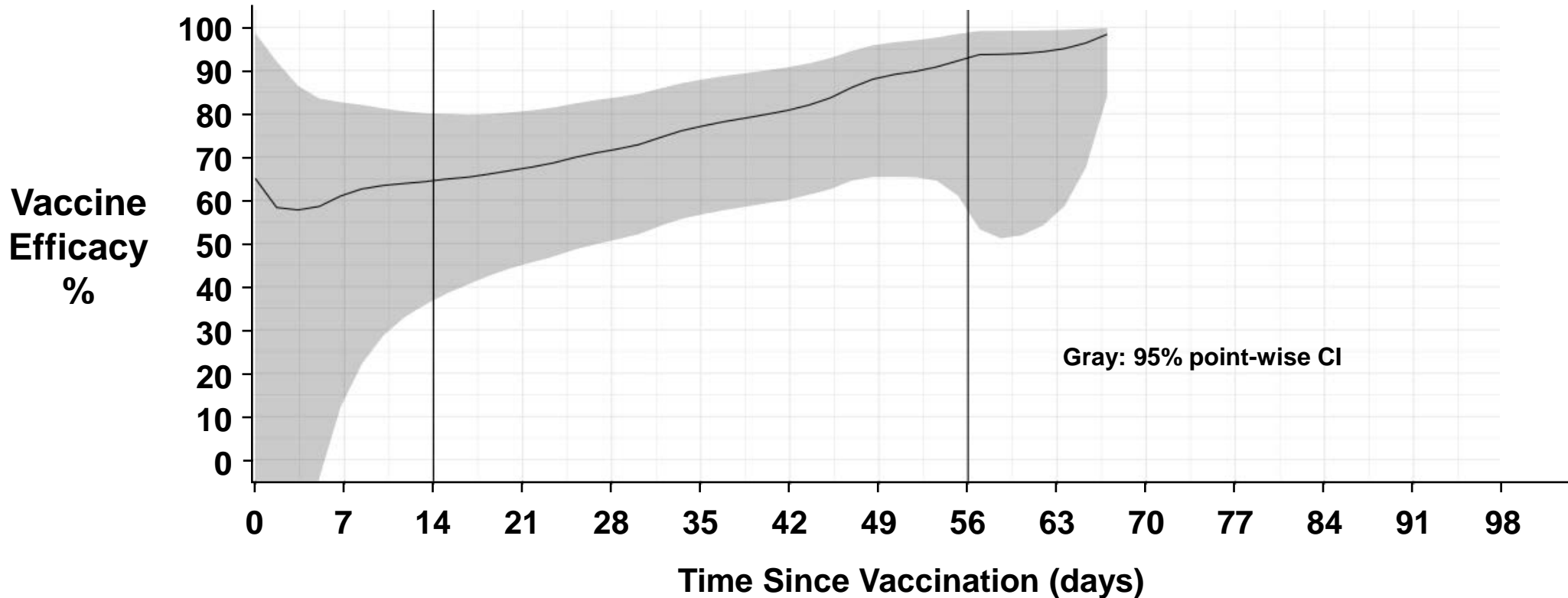
Participants at risk

Ad26.COVS2.S	19744	19741	19734	19725	19718	19705	18685	15043	11046	7919	4039	1481	720	490	490	489	146	31	0
Placebo	19822	19817	19799	19779	19760	19725	18682	15088	11069	7939	3995	1485	732	500	497	495	137	29	0

Number of cases

Ad26.COVS2.S	0	3	7	11	16	18	20	21	21	21	21	21	21	21	21	21	21	21	21
Placebo	0	5	18	32	44	55	65	73	76	76	77	77	78	78	78	78	78	78	78

Vaccine Efficacy Against Severe/Critical COVID-19 Increased Over Time Through Day 56



Days of follow-up	7	14	28	42	56	70	84	98
% of participants with follow-up	~100%	~100%	99%	93%	55%	20%	4%	2%

Data Support Substantial Effect on Prevention of COVID-19 Related Hospitalizations

<i>PP At Risk Set</i>	Ad26.COVS.2 Cases, n	Placebo Cases, n	VE (95% CI)
> Day 14			
PCR+ cases from any source, regardless of central confirmation	2	29	93.1% (72.7, 99.2)
> Day 28			
PCR+ cases from any source, regardless of central confirmation	0	16	100.0% (74.3, 100.0)

Ad26.COVS Data Support Protection Against COVID-19-Related Deaths

<i>Full Analysis Set</i> <i>Through January 22, 2021</i>	Ad26.COVS N = 21,895	Placebo N = 21,888
All cause mortality	3	16
COVID-19 confirmed death > Day 1	0	5*

*One PCR+ participant at baseline, not included

<i>Full Analysis Set</i> <i>From January 22, 2021 to February 5, 2021</i>	Ad26.COVS N = 21,895	Placebo N = 21,888
Additional deaths reported	2	4
COVID-19 confirmed death > Day 1	0	1

- All COVID-19 associated deaths occurred in South Africa

Subset of Data Show Effect Against Asymptomatic/Undetected COVID-19

<i>Per Protocol</i>	> Day 29		VE (95%CI)
	Ad26.COVS.S N = 19,630	Placebo N = 19,691	
<i>Serology Risk Set (Day 71 serology results)</i>	N = 1,346	N = 1,304	
Seroconverted SARS-CoV-2 (Day > 29)^a	18	50	65.5% (39.9, 81.1)
Seroconverted SARS-CoV-2 without previous symptoms (Day > 29)^{a,b}	10	37	74.2% (47.1, 88.6)

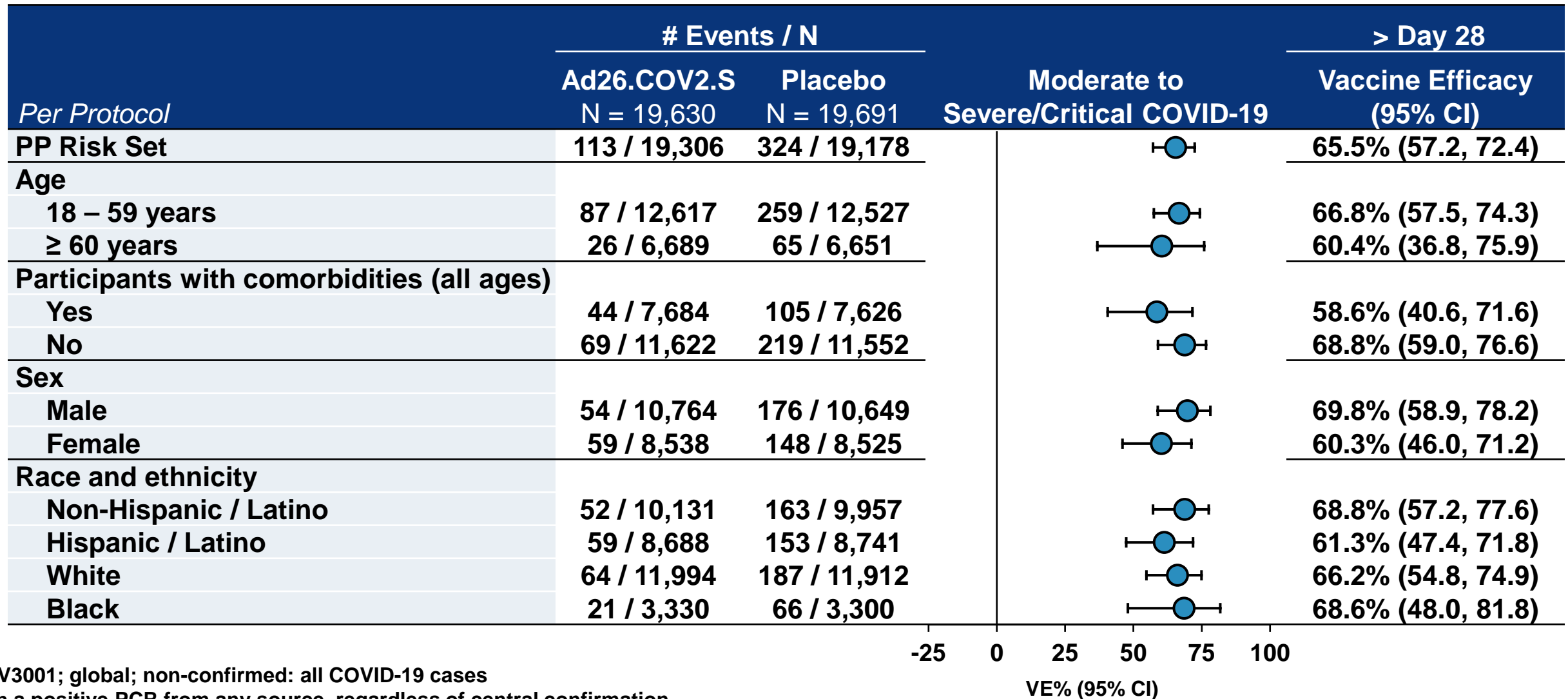
^a Serologically converted: positive serology (Non-S protein) test without SARS-CoV-2 positive RT-PCR before positive serology test irrespective of previous symptoms

^b Without previous symptoms: no COVID-19 symptoms occurred before positive serology test at any point during study

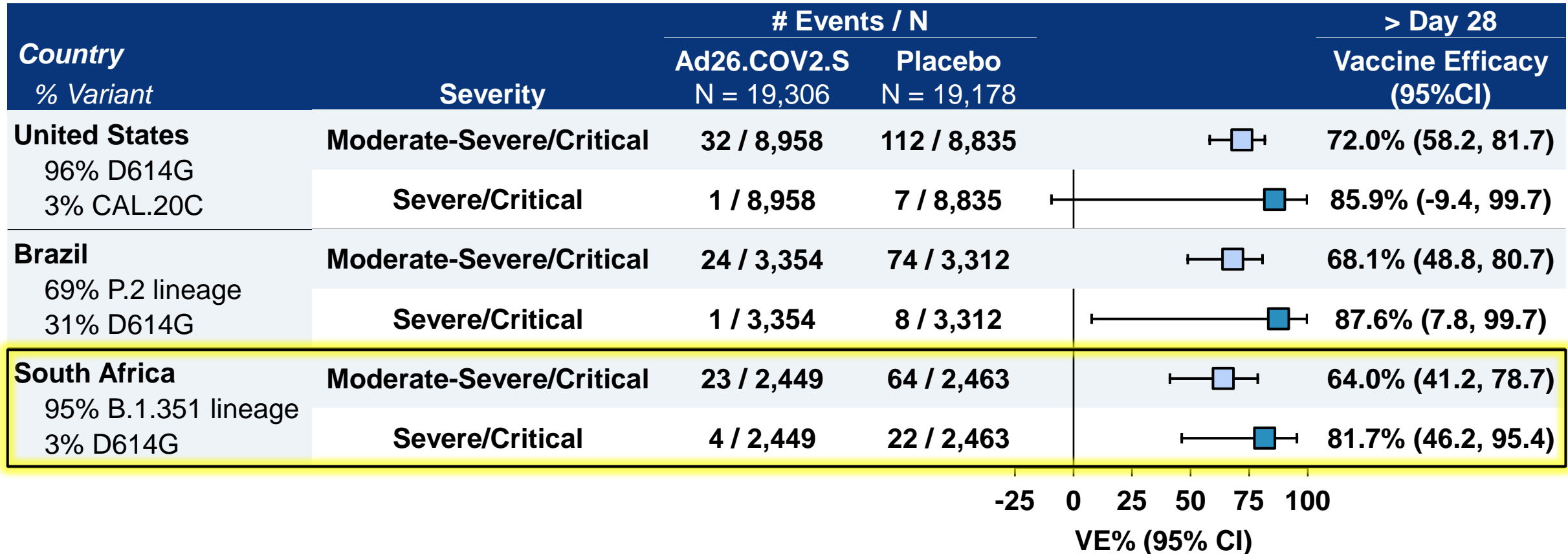
Study COV3001: Additional Analyses

- Vaccine efficacy by prespecified subgroups
- Vaccine efficacy by countries with emerging variants

Overall VE Against Moderate to Severe/Critical COVID-19 Consistent Across Prespecified Subgroups



Vaccine Efficacy Consistently High Across Key Countries > Day 28



South Africa	<i>PP At Risk Set (N = 4,912)</i>	Hospitalizations > Day 28*:	0 vs 6 (Ad26.COVS.S vs placebo)
	<i>Full Analysis Set (N = 6,576)</i>	COVID-related deaths:	0 vs 5** (Ad26.COVS.S vs placebo)

COV3001; non-confirmed: all COVID-19 cases with a positive PCR from any source, regardless of central confirmation

*Sources: MRU (Medical Resource Utilization), SAE, and MA-COV (medical attendance-COV); **6th case excluded due to PCR+ test at baseline

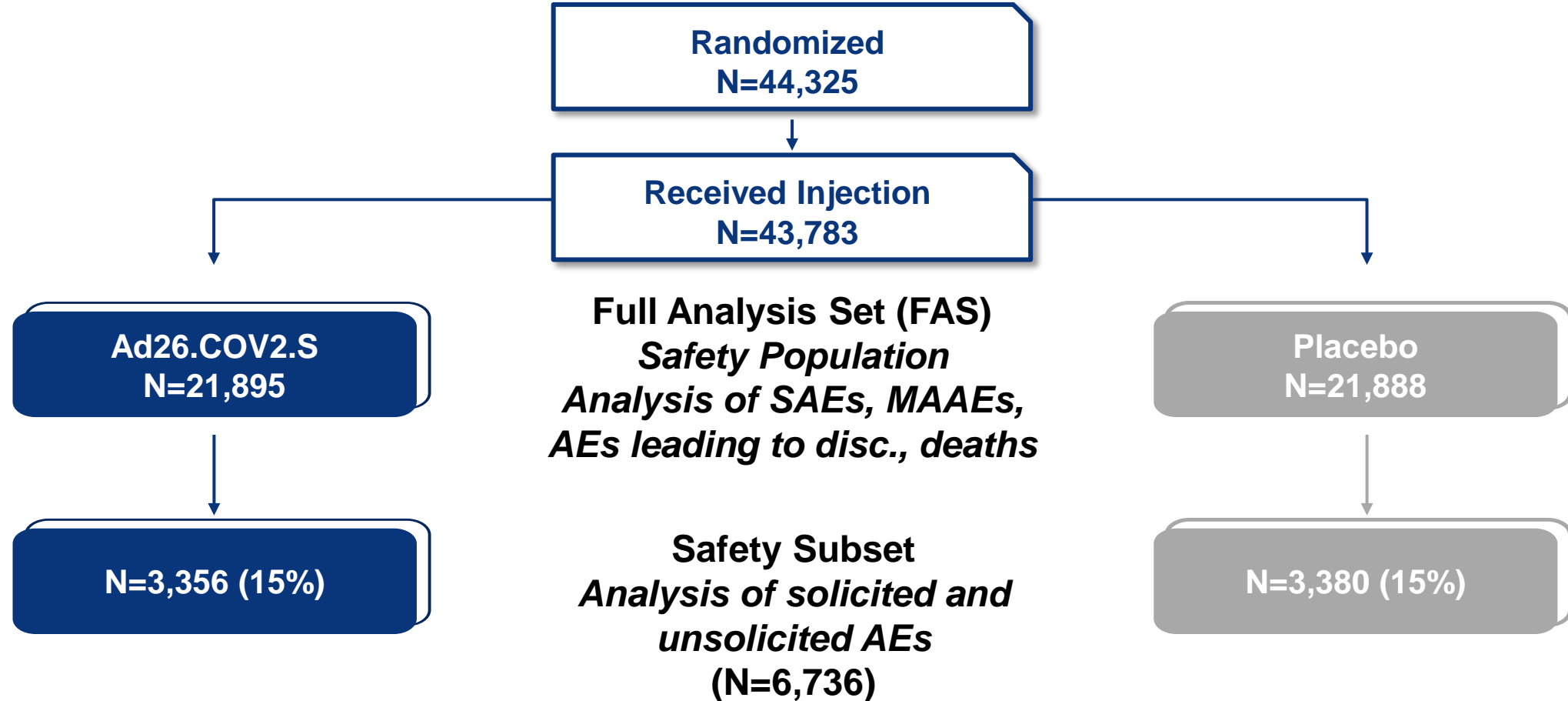
Single Dose of Ad26.COVS Offers Substantial Protection Against COVID-19

- 85% VE* against severe disease
 - Onset of protection as early as 7 days after vaccination
 - Complete protection against COVID-19 related hospitalizations* and deaths
- 66% VE* against moderate to severe disease across all countries
 - Onset evident as early as Day 14, and increased through Day 56
- 72% VE* against moderate to severe COVID-19 in US
 - Study participants reflected the diversity of the overall US population
- Protection against all symptomatic disease consistent with primary endpoint
- High-quality, robust data at a time when the incidence of SARS-CoV-2 was increasing, and new, highly transmissible variants were emerging
- High levels of protection consistent across subgroups, countries and regions*



Study COV3001: Safety Results

COV3001 Safety Subset Includes Data on Solicited and Unsolicited Adverse Events



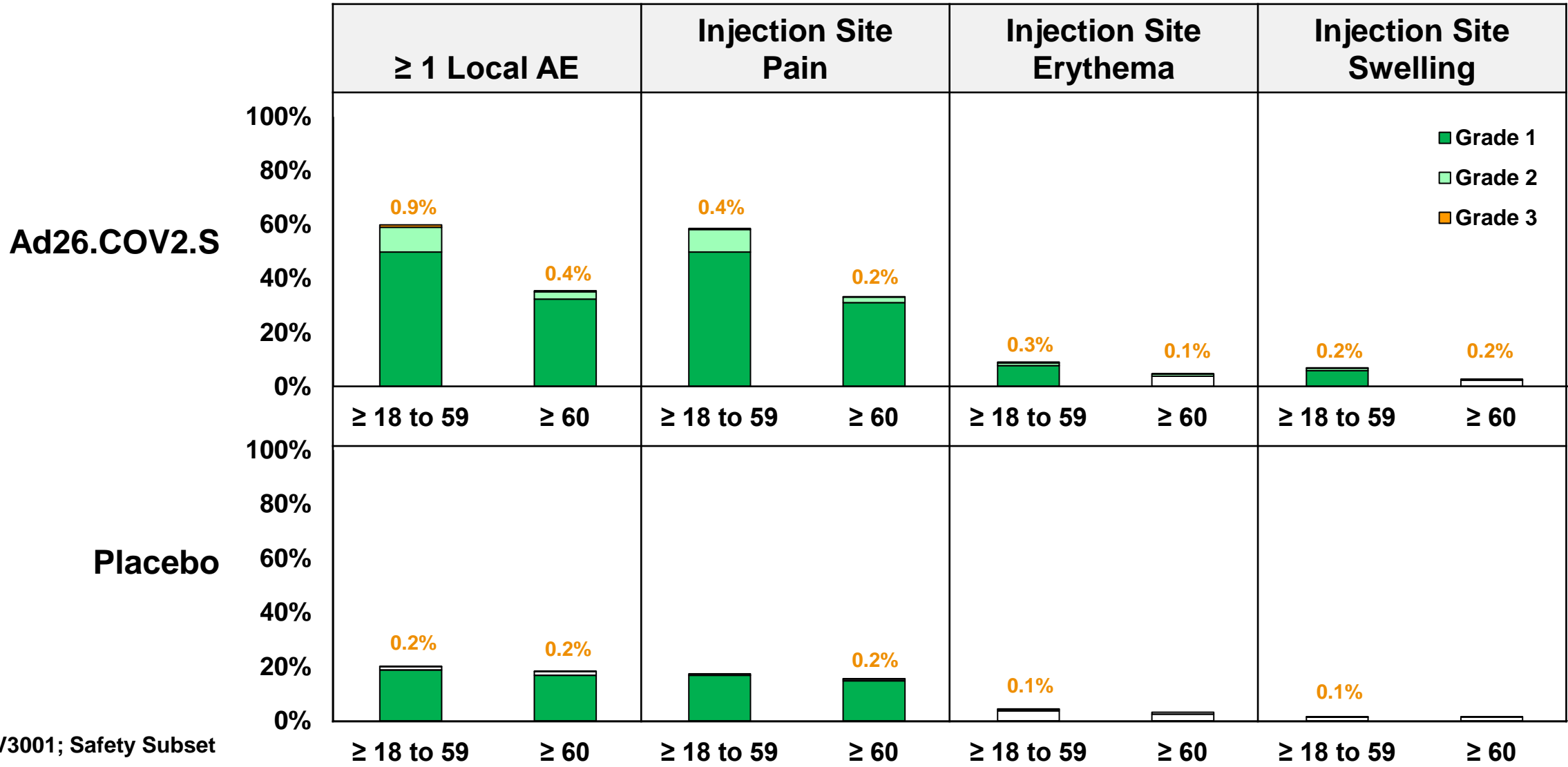
Safety Data Met FDA Guidelines for Median Follow-Up of At Least 2 Months

- Median follow up after vaccination was 58 days
- Full Analysis Set: 55% had ≥ 2 months of follow-up
- Safety Subset: nearly all (99.9%) completed post-vaccination period of Day 1-29



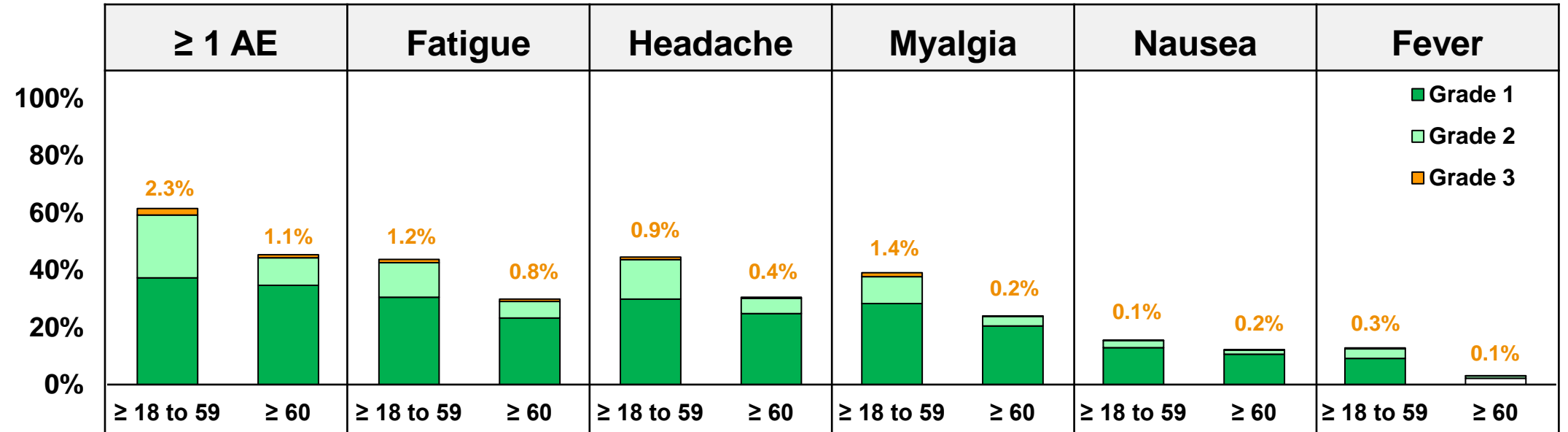
Study COV3001: Solicited Adverse Events

Local Adverse Events, Nearly All Grade 1 and 2 in Severity, All Events Resolved 2-3 Days After Injection

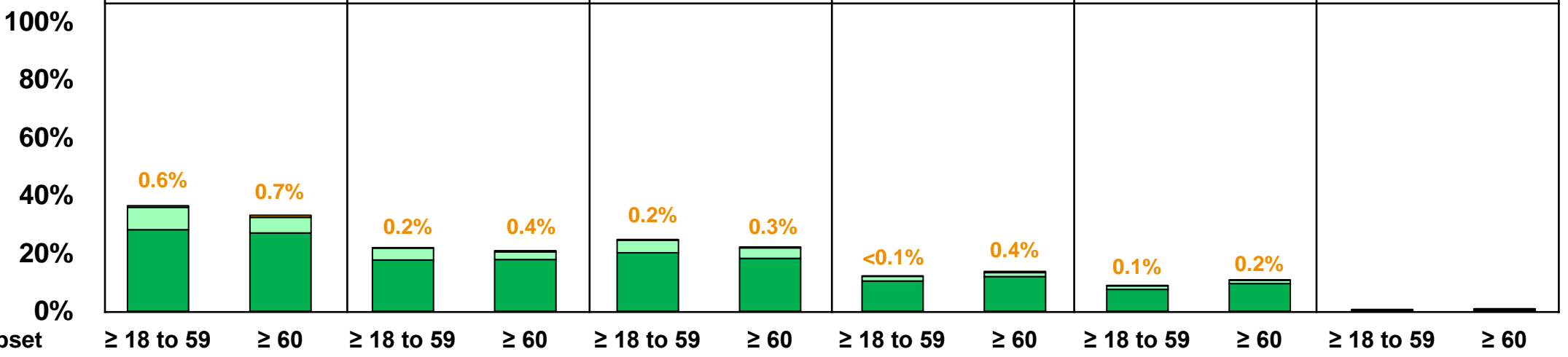


Systemic Adverse Events Transient with Median Duration of 1-2 Days

Ad26.COV2.S



Placebo



COV3001; Safety Subset



Study COV3001: Unsolicited Adverse Events

Similar Rates of Unsolicited AEs Between Groups

Unsolicited Adverse Events	Ad26.COVS.S		Placebo	
	n	%	n	%
Safety Subset	N = 3,356		N = 3,380	
Any Adverse Event (AE)	440	13%	407	12%
Full Analysis Set (FAS)	N = 21,895		N = 21,888	
Any Medically-Attended Adverse Event (MAAE)	304	1.4%	408	1.9%
Any Serious Adverse Event (SAE)	90	0.4%	137	0.6%
Not COVID-19-related SAE	83	0.4%	96	0.4%
Any death (reported through January 22, 2021)	3	<0.1%	16	0.1%
COVID-19 related deaths	0	-	5*	-

Other Adverse Events of Interest

<i>Full Analysis Set</i>	Ad26.COVS.2.S	Placebo
	N = 21,895	N = 21,888
	n	n
Hypersensitivity*	77	65
Venous thromboembolic events**	14	10
Convulsions	4***	1
Tinnitus	6	0
Peripheral neuropathy	2	2
Guillain-Barre Syndrome	1	1
Bell's Palsy	3	2

COV3001

*No anaphylaxis

**Most participants had relevant predisposing medical conditions and/or other factors

***Three participants with history of epilepsy, one additional event followed transverse sinus thrombosis

Thrombotic and Thromboembolic Events

<i>Full Analysis Set</i>	Ad26.COVS.2.S	Placebo
	N = 21,895	N = 21,888
	n	n
Total participants with any event	14	10
Venous thromboembolic events		
Deep vein thrombosis	6	2
Pulmonary embolism	4	1
Transverse sinus thrombosis	1	0
Thrombosed hemorrhoid	0	1
Total participants with venous events	11	4
Arterial thromboembolic events		
Cerebrovascular events	3*	3
Cardiovascular events	1	3
Total participants with arterial events	3	6

Benefits of Ad26.COV2.S Outweigh Known and Potential Risks

- Demonstrated acceptable safety and reactogenicity profile
- Overall, reactogenicity mild and transient
 - Grade 3 reactogenicity rare
- Most AEs mild or moderate
 - Generally resolved 1 to 2 days post vaccination
- Safety further supported by > 193,000 individuals exposed to Janssen Ad26-based vaccines

COV3001 Protocol Amendment to Facilitate Cross-Over of Placebo Participants

- Upon authorization by a regulatory authority, all placebo participants to receive 1 dose of Ad26.COV2.S
- All participants encouraged to remain in study up to 2 years to assess efficacy, safety, immunogenicity
- Amendment will allow assessment of
 - Duration of protection and immunogenicity of single dose by comparing 2 groups vaccinated ~4-6 months apart

Overview of Janssen's Single-Dose COVID-19 Vaccine, Ad26.COV2.S

Janssen Pharmaceutical Companies
of Johnson & Johnson

US Centers for Disease Control and Prevention
Advisory Committee on Immunization Practices

February 28, 2021