SUPPLEMENTARY TABLE 2. Vaccine effectiveness* of bivalent compared with effectiveness of original monovalent vaccination against all-cause thromboembolic events† among immunocompetent Medicare beneficiaries aged ≥65 years and beneficiaries aged ≥18 years with end stage renal disease receiving dialysis§ without additional immunocompromising conditions, by age group and time since vaccination — United States, September 2022–March 2023

	Immunocompetent beneficiaries aged ≥65 years				Beneficiaries aged ≥18 years with ESRD receiving dialysis without additional immunocompromising conditions			
Age group (yrs)/vaccination status	No. of beneficiaries	No. of TE	Median follow-up days contributed to category¶	aVE (95% CI)**	No. of beneficiaries	No. of TE	Median follow-up days contributed to category	aVE (95% CI)††
≥18								
Original Vaccine Only (Ref)§§	—	—	—	—	55,981	6,752	177	Ref
Bivalent Vaccine Overall¶¶	—	—	—	—	22,637	1,318	111	18 (12 to 23)
7–59 days since vaccination	—	—	—	—	3,100	600	53	24 (17 to 31)
≥60 days since vaccination	—	—	—	—	19,537	718	58	11 (2 to 18)
18–64								
Original Vaccine Only (Ref)	—	—	—	—	23,182	2,223	181	Ref
Bivalent Vaccine Overall	—	—	—	—	7,058	303	98	18 (8 to 27)
7–59 days since vaccination	—	—	—	—	—	—	—	—
≥60 days since vaccination	—	—	—	—	—	—	—	—
≥65								
Original Vaccine Only (Ref)	7,039,158	154,264	181	Ref	32,799	4,529	150	Ref
Bivalent Vaccine Overall	5,667,018	51,388	130	20 (19 to 21)	15,579	1,015	115	18 (11 to 23)
7–59 days since vaccination	363,267	21,248	53	21 (20 to 22)	1,971	438	53	28 (20 to 35)
≥60 days since vaccination	5,303,751	30,140	77	19 (18 to 20)	13,608	577	62	8 (–2 to 17)

Abbreviations: aVE = adjusted vaccine effectiveness; ESRD = end stage renal disease; Ref = reference group; TE = thromboembolic events.

* Vaccine effectiveness was calculated as (1 − hazard ratio) x 100%.

† Defined as the first occurrence of clotting outcomes (i.e., myocardial infarction, ischemic stroke, or venous thromboembolism) after index date.

§ Defined as having at least 1 dialysis encounter (excluding acute kidney injury) in the 90 days before the index date. Persons with end stage renal disease receiving dialysis are eligible for Medicare benefits, regardless of age.

¶ A single beneficiary can contribute follow-up time in multiple categories. The maximum number of follow—up time post-bivalent vaccination is 181 days.

** Adjusted vaccine effectiveness was estimated using a doubly robust approach: implementing inverse probability of treatment weighting and further adjusting for adjusting for influenza vaccination status, receipt of original monovalent booster, time since original monovalent vaccine >150 days, and urban/rural residence.

†† Adjusted vaccine effectiveness was estimated using a doubly robust approach: implementing inverse probability of treatment weighting and further adjusting for age, race, receipt of original monovalent booster, and time since original monovalent vaccine >150 days.

§§ Beneficiaries had documented claims for ≥2 original monovalent mRNA vaccine doses, ≥2 Novavax vaccine doses, or ≥1 Janssen vaccine dose. A single dose (i.e., Janssen), 2nd dose, 3rd dose, or monovalent booster administration code was considered adequate to meet the inclusion criteria.

¶¶ Defined as receipt of a COVID-19 bivalent mRNA vaccine dose at least 7 days prior or receipt of original monovalent doses only. Bivalent doses were identified using codes from the Healthcare Common Procedure Coding System (HCPCS) and Current Procedural Terminology (CPT) and must have been administered after August 31, 2022. Beneficiaries could change vaccination status during the study period.