Supplemental Online Content

Chen JJ, Lee TH, Tian YC, Lee CC, Fan PC, Chang CH. Immunogenicity rates after SARS-CoV-2 vaccination in people with end-stage kidney disease: a systematic review and meta-analysis. *JAMA Netw Open*. 2021;4(10):e2131749. doi:10.1001/jamanetworkopen.2021.31749

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This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. Search Strategy and Result

Pubmed through July 30st, 2021

- #2 ((COVID-19) OR (SARS-CoV-2)) AND (coronavirus)
- #3 ((((COVID-19 Vaccines[MeSH Terms]) OR (Immunogenicity, Vaccine[MeSH Terms])) OR (Spike Glycoprotein, Coronavirus[MeSH Terms])) OR (vaccine)) OR (vaccination)
- #4 1# AND 2# AND #3 + Filters: from 2019 2021, Result: 104

Medline through July 30st, 2021

- #1 Renal Dialysis/ or Dialysis/
- #2 end stage renal disease.mp. or Kidney Failure, Chronic/
- #3 AstraZeneca.mp.
- #4 mRNA vaccine.mp.
- #5 Tozinameran.mp.
- #6 Comirnaty.mp.
- #7 Moderna.mp.
- #8 Janssen.mp.
- #9 bnt162b2.mp.
- #10 pfizer-biontech.mp.
- #11 mrna-1273.mp.
- #12 COVID-19 vaccine.mp. or COVID-19 Vaccines/
- #13 #1 AND #2

- #14 #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12
- #15 #13 AND #14, Result: 46

EMbase through July 30st, 2021

- #1 'dialysis'/exp OR dialysis'
- #2 'hemodialysis'/exp OR hemodialysis'
- #3 'peritoneal dialysis'/exp OR 'peritoneal dialysis' OR (peritoneal AND ('dialysis'/exp OR dialysis))
- #4 'chronic kidney failure'/exp OR 'chronic kidney failure' OR (chronic AND ('kidney'/exp OR kidney) AND ('failure'/exp OR failure))
- #5 #1 OR #2 OR #3 OR #4
- #6 'sars-cov-2 vaccine'/exp OR 'sars-cov-2 vaccine'
- #7 'mrna-1273 vacccine' /exp OR 'mrna-1273 vacccine'
- #8 'chadox1 ncov 19' /exp OR 'chadox1 ncov 19'
- #9 'bnt162b2' /exp OR 'bnt162b2'
- #10 'astrazeneca'/exp OR 'astrazeneca'
- #11 ('mrna'/exp OR mrna) AND ('vaccine'/exp OR vac cine)
- #12 'tozinameran'/exp OR tozinameran
- #13 'comirnaty'/exp OR comirnaty
- #14 'moderna'/exp OR moderna
- #15 'pfizer biontech'
- #16 'ad26.cov2.s'/exp OR ad26.cov2.s
- #17 #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16
- #18 #5 AND #17, Result 768 articles
- #19 #18 AND (2020:py OR 2021:py) , Result 335 articles

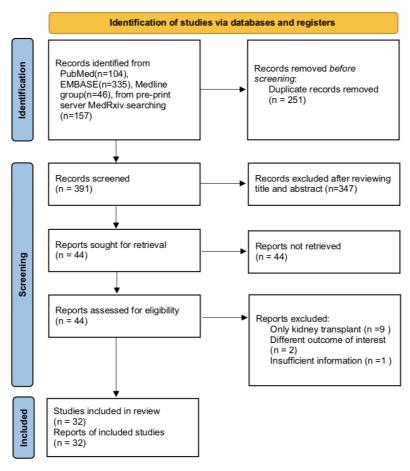
eTable 2. Newcastle-Ottawa Scale Assessment of the Included Studies

study	Representativeness of the exposed cohort (1)	Selection of the non exposed cohort (1)	Ascertainment of exposure (1)	Demonstration that outcome of interest was not present at start of study (1)	Comparability of cohorts on the basis of the design or analysis (2)	Assessment of outcome (1)	Was follow- up long enough for outcomes to occur (1)	Adequacy of follow up of cohorts (1)	NOS_score
Agur,2021	1	0	1	1	0	1	1	1	6
Anand,2021	1	0	1	0	0	1	1	1	5
Attias, 2021	1	0	1	0	0	1	1	1	5
Bertrand,2021	1	0	1	1	0	1	1	1	6
Billany,2021	1	0	1	0	0	1	1	1	5
Broseta,2021	1	0	1	1	0	1	1	1	6
Chan, 2021	1	0	1	0	0	1	1	1	5
Clarke, 2021	1	5	1	0	0	1	1	1	5
Danthu,2021	1	1	1	1	1	1	1	1	8
Duarte, 2021	1	0	1	1	0	1	1	1	6
Ducloux,2021	1	0	1	0	0	1	1	1	5
Frantzen,2021	1	0	1	0	0	1	1	1	5
Frantzen,2021 (3rd boost dose cohort)	1	0	1	1	0	1	1	1	6
Goupil,2021	1	0	1	1	0	1	1	1	6
Grupper,2021	1	1	1	0	1	1	1	1	7
Lacson,2021	1	0	1	0	0	1	1	1	5
Jahn, 2021	1	1	1	1	1	1	1	1	8

Lanay 2024		1							
Lensy,2021	1	1	1	1	1	1	1	1	8
Longlune,2021	1	0	1	1	0	1	1	1	6
Rincon- Arevalo,2021	1	1	1	0	1	1	1	1	7
Rodríguez- Espinosa,2021	1	0	1	1	0	1	1	1	6
Sattler, 2021	1	1	1	1	1	1	1	1	8
Schrezenmeier, 2021	1	1	1	1	1	1	1	1	8
Simon, 2021	1	1	1	1	1	1	1	1	8
Speer,2021	1	1	1	1	1	1	1	1	8
Strengert,2021	1	1	1	1	1	1	1	1	8
Torreggiani,2021	1	0	1	0	0	1	1	1	5
Weigert, 2021	1	1	1	1	1	1	1	1	8
Yanay, 2021	1	1	1	1	1	1	1	1	8
Yau,2021	1	1	1	0	1	1	1	1	7
Yi, 2021	1	0	1	1	0	1	1	1	6
Zitt, 2021	1	0	1	1	0	1	1	1	6

eFigure 1. Study Inclusion Flowchart

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

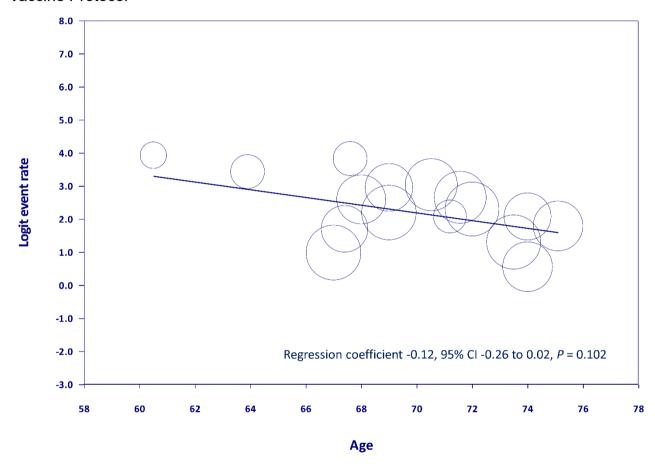
eFigure 2. Sensitivity Analysis of Pooled Immunogenicity Rate in Patients Receiving Dialysis After Excluding the Preprint Articles

Study	Dose	Modality	Infection	n/N		Response rate (95% CI)	Weight (%)
Agur	2	HD	No	114 / 122	-	0.93 (0.87 to 0.97)	3.9
Agur	2	PD	No	22 / 23		0.96 (0.75 to 0.99)	2.2
Attias	2	HD	Mixed	55 / 64	-	0.86 (0.75 to 0.93)	3.9
Bertrand	2	HD	No	8/9		0.89 (0.50 to 0.98)	2.1
Billany	1	HD	Mixed	75 / 94		0.80 (0.70 to 0.87)	4.1
Broseta	2	HD	No	167 / 175	-	0.95 (0.91 to 0.98)	3.9
Chan	2	HD	Mixed	58 / 61	-	0.95 (0.86 to 0.98)	3.3
Danthu	2	HD	No	59 / 75		0.79 (0.68 to 0.86)	4.1
Ducloux	2	HD	No	40 / 45		0.89 (0.76 to 0.95)	3.6
Frantzen	2	HD	Mixed	221 / 244	-	0.91 (0.86 to 0.94)	4.2
Goupil	1	HD	Yes	16 / 19		0.84 (0.61 to 0.95)	3.2
Goupil	1	HD	No	75 / 131		0.57 (0.49 to 0.65)	4.3
Grupper	2	HD	Mixed	54 / 56		0.96 (0.87 to 0.99)	3.0
Lacson	2	HD	Mixed	165 / 186	-■-	0.89 (0.83 to 0.93)	4.2
Jahn	2	HD	No	67 / 72	-	0.93 (0.84 to 0.97)	3.7
Lensy	1	HD+PD	No	8 / 27		0.30 (0.16 to 0.49)	3.8
Longlune	2	HD	No	64 / 78	—■—	0.82 (0.72 to 0.89)	4.1
Longlune	2	PD	No	17 / 20		0.85 (0.62 to 0.95)	3.2
Rincon-Arevalo	2	HD+PD	Mixed	31 / 44		0.70 (0.56 to 0.82)	4.0
Rodríguez-Espinosa	2	PD	No	31 / 32		0.97 (0.81 to 1.00)	2.2
Sattler	2	HD	No	22 / 26		0.85 (0.65 to 0.94)	3.4
Schrezenmeier	2	HD+PD	No	32 / 36	——■	0.89 (0.74 to 0.96)	3.5
Simon	2	HD	No	59 / 81	———	0.73 (0.62 to 0.81)	4.2
Speer	2	HD	No	14 / 22		0.64 (0.42 to 0.81)	3.7
Torreggiani	1	HD	Mixed	35 / 95	-	0.37 (0.28 to 0.47)	4.2
Yanay	2	HD	No	144 / 160		0.90 (0.84 to 0.94)	4.1
Yi	2	NR	No	26 / 31		0.84 (0.67 to 0.93)	3.6
Zitt	2	HD	No	46 / 47		0.98 (0.86 to 1.00)	2.2
Summary (I-square =	= 89.8%)				\Rightarrow	0.85 (0.79 to 0.90)	
				0.0	0.2 0.4 0.6 0.8 1.0	-	
					Response rate (95% CI)		

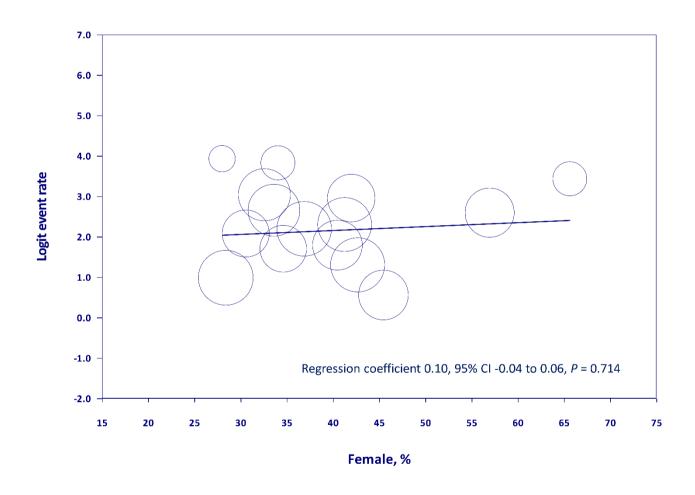
eFigure 3. Subgroup Analysis Comparing the Pooled Immunogenicity Rates in Patients Receiving Hemodialysis or Peritoneal Dialysis in SARS-CoV-2–Naive Dialysis Population With Complete Vaccine Protocol

Modality / Study	n/N			Response rate (95% CI)	Weight (%)
HD					
Agur	114 / 122		-	0.93 (0.87 to 0.97)	4.9
Anand	401 / 519		-	0.77 (0.73 to 0.81)	7.1
Bertrand	8/9	_		0.89 (0.50 to 0.98)	1.4
Billany	55 / 74			0.74 (0.63 to 0.83)	5.8
Broseta	167 / 175		-	0.95 (0.91 to 0.98)	4.9
Chan	38 / 41			0.93 (0.80 to 0.98)	3.1
Clarke	475 / 553		-	0.86 (0.83 to 0.89)	7.0
Danthu	59 / 75		-	0.79 (0.68 to 0.86)	5.6
Duarte	36 / 42			0.86 (0.72 to 0.93)	4.2
Ducloux	40 / 45			0.89 (0.76 to 0.95)	4.0
Frantzen	190 / 212		-	0.90 (0.85 to 0.93)	6.2
Jahn	67 / 72		-	0.93 (0.84 to 0.97)	4.1
Lacson	127 / 148		-	0.86 (0.79 to 0.91)	6.1
Longlune	64 / 78			0.82 (0.72 to 0.89)	5.5
Sattler	22 / 26			0.85 (0.65 to 0.94)	3.5
Simon	59 / 81			0.73 (0.62 to 0.81)	5.9
Speer	14 / 22		-	0.64 (0.42 to 0.81)	4.2
Strengert	77 / 81		-	0.95 (0.88 to 0.98)	3.7
Weigert	130 / 143		-	0.91 (0.85 to 0.95)	5.6
Yanay	144 / 160		-	0.90 (0.84 to 0.94)	5.8
Zitt	46 / 47			0.98 (0.86 to 1.00)	1.5
Summary (<i>I</i> -square =	78.6%)		\Diamond	0.87 (0.83 to 0.90)	
PD					
Agur	22 / 23			0.96 (0.75 to 0.99)	21.9
Duarte	25 / 25			0.98 (0.76 to 1.00)	12.4
Longlune	17 / 20			0.85 (0.62 to 0.95)	43.6
Rodríguez-Espinosa	31 / 32			0.97 (0.81 to 1.00)	22.1
Summary (I-square =	: 18.2%)		\rightarrow	0.94 (0.84 to 0.98)	
P for subgroup differer	nce = 0.153				
		0.0 0.2 0.4 0	0.6 0.8 1.0		
		Response ra	ie (93% CI)		

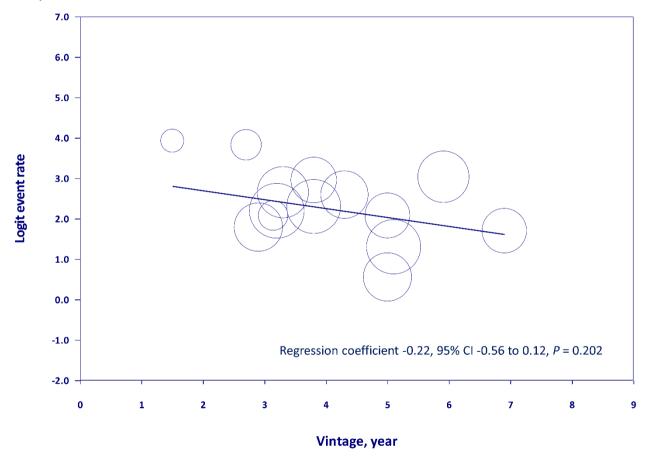
eFigure 4. Associations Between Age and Immunogenicity Rates in SARS-CoV-2–Naive Dialysis Population with Complete Vaccine Protocol



eFigure 5. Associations Between Proportion of Women and Immunogenicity Rates in SARS-CoV-2–Naive Dialysis Population With Complete Vaccine Protocol



eFigure 6. Associations Between Dialysis Vintage and Immunogenicity Rates in SARS-CoV-2–Naive Dialysis Population With Complete Vaccine Protocol



eFigure 7. Funnel Plot Illustrating Publication Bias

