

Multisystem Inflammatory Syndrome in Children (MIS-C) in Persons Fully Vaccinated with Two Doses of mRNA COVID-19 Vaccine Compared with Persons with Partial or No Vaccination Reported, U.S. National MIS-C Surveillance

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BACKGROUND

CDC began collecting COVID-19 vaccination status of persons with MIS-C as part of national surveillance in May 2021. We describe and compare MIS-C in fully vaccinated persons with MIS-C in those with partial or no vaccination reported.

METHODS

We identified COVID-19 vaccine age-eligible persons meeting the CDC MIS-C case definition reported by health departments as of September 6, 2022, and divided them into 3 groups:

- 1) Fully vaccinated (receipt of a 2-dose mRNA primary vaccine series with MIS-C onset ≥ 28 days after vaccine dose 2 to account for the delay between infection and MIS-C);
- 2) Partially vaccinated (MIS-C onset after dose 1 or < 28 days from dose 2 or receipt of Janssen [Johnson & Johnson]; vaccine and;
- 3) No vaccination reported.

RESULTS

- Of 8,898 MIS-C cases reported, 1,485 were vaccine eligible: 89 fully vaccinated, 91 partially vaccinated, and 1,305 with no vaccination reported.
- Those with Non-Hispanic white race/ethnicity were more likely to report full vaccination vs no vaccination (55% vs 43%, $p=0.03$)
- Shock/receipt of pressors and ICU-level care differed significantly in fully vaccinated vs those with no vaccination reported (32% vs 43%, $p=0.04$ and 45% vs 59%, $p=0.01$).
- Twenty-one (2%) of those with no vaccination reported died; no fully or partially vaccinated persons died.

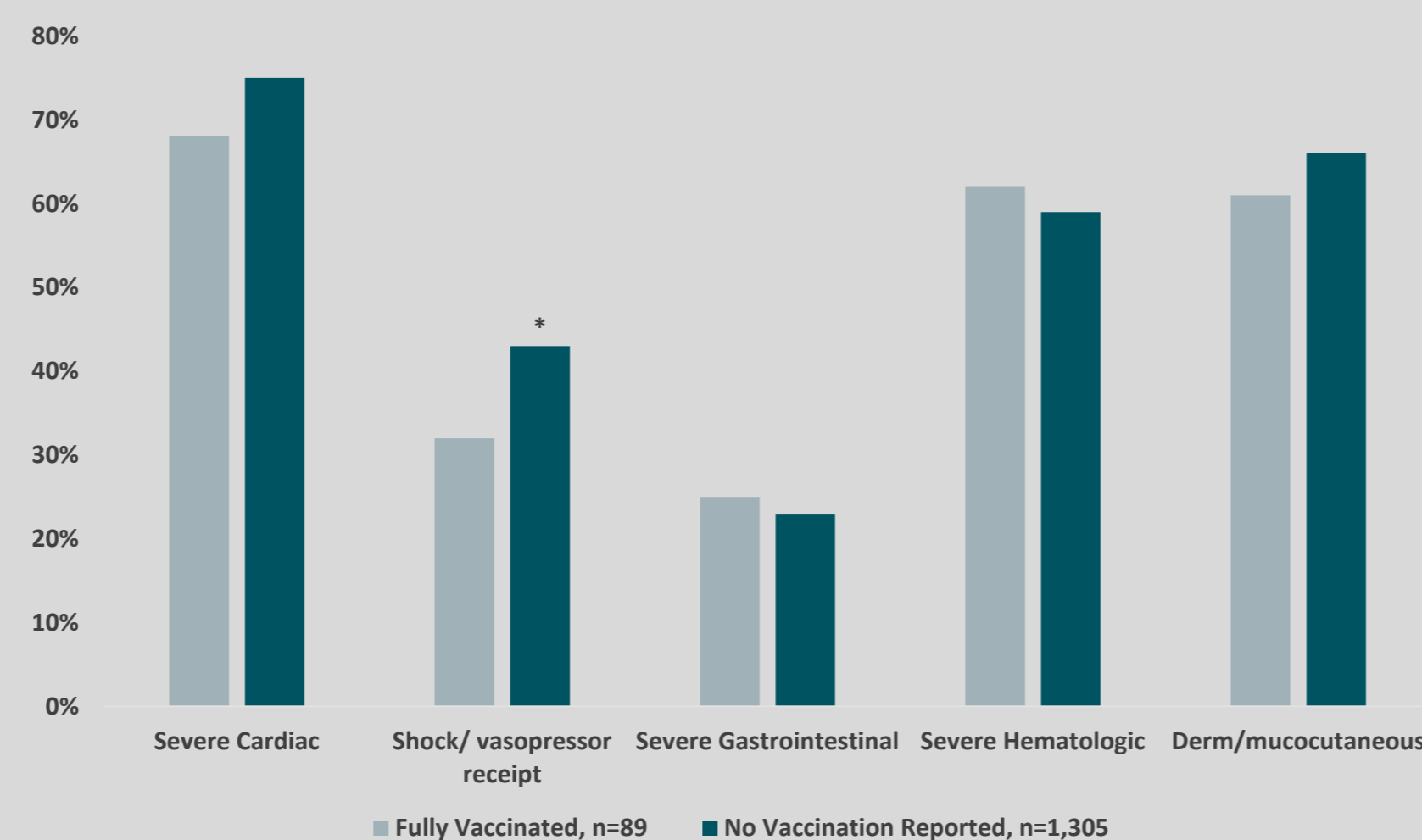
CONCLUSIONS

- Persons who acquire SARS-CoV-2 infection after being fully vaccinated can develop MIS-C, with similar clinical characteristics to those with no vaccination reported.
- A lower and statistically significant percentage of fully vaccinated persons required ICU-level care compared with those with no vaccination reported, and there were no deaths in the fully vaccinated group.
- These data do not account for trends in MIS-C over time, including the influence of circulating SARS-CoV-2 variants on MIS-C clinical manifestations.

Fewer persons who develop MIS-C after being fully vaccinated require ICU-level care compared with those with no vaccination reported.

No MIS-C deaths were reported in fully and partially vaccinated persons compared with 21 deaths in those with no vaccination reported.

Table 2. Multisystem Inflammatory Syndrome in Children Organ Involvement of Persons with No COVID-19 Vaccination Reported Compared with Partially and Fully Vaccinated Persons



*Chi Square $p < 0.05$

	No Vaccination Reported (n=1,305)		Partially Vaccinated (n=91)		Fully Vaccinated (n=89)	
	n (%)	p value ¹	n (%)	p value ¹	n (%)	p value ¹
Severe cardiovascular ²	980 (75)	0.311	64 (70)	0.311	61 (68)	0.169
Shock/vasopressor receipt	559 (43)	0.997	39 (43)	0.997	28 (32)	0.036
Severe gastrointestinal ³	293 (23)	0.270	25 (28)	0.270	22 (25)	0.621
Severe hematologic ⁴	768 (59)	0.766	55 (60)	0.766	55 (62)	0.584
Dermatologic/mucocutaneous	863 (66)	0.545	63 (69)	0.545	54 (61)	0.294

¹No vaccination reported = comparator group, P-values from Chi square or Fischer's Exact tests and Kruskal-Wallis
²Ventricular dysfunction, pericardial effusion/pericarditis, myocarditis, congestive heart failure, arrhythmia, elevated troponin, elevated BNP or NT-pro BNP $\geq 1,000$ pg/mL, shock/receipt of vasopressors, or extracorporeal membranous oxygenation (ECMO)
³Mesenteric adenitis, free fluid, hepatosplenomegaly, colitis/enteritis, cholecystitis/gallbladder abnormalities, or appendicitis/appendiceal changes
⁴Thrombocytopenia, lymphopenia, neutropenia, or thrombosis

Table 1. Demographic and Clinical Characteristics of Persons with MIS-C with No COVID-19 Vaccination Reported Compared with Partially and Fully Vaccinated Persons

	No Vaccination Reported (n=1,305)		Partially Vaccinated (n=91)		Fully Vaccinated (n=89)	
	n (%)	p value ¹	n (%)	p value ¹	n (%)	p value ¹
5-11 Yrs.	523 (40)	0.030	47 (52)	0.030	33 (37)	0.576
12-15 Yrs.	551 (40)	0.187	32 (35)	0.187	37 (42)	0.905
16-20 Yrs.	231 (18)	0.272	12 (13)	0.272	19 (21)	0.386
Male	825 (63)	0.297	52 (58)	0.297	54 (61)	0.624
Non-Hispanic Black	387 (32)	0.827	26 (29)	0.827	18 (22)	0.058
Non-Hispanic White	526 (43)	0.631	39 (43)	0.631	46 (55)	0.027
Non-Hispanic Asian	34 (3)	0.374	1 (1)	0.374	3 (4)	0.656
Non-Hispanic Other ²	64 (5)	0.488	3 (3)	0.488	4 (5)	0.872
Hispanic	214 (18)	0.769	16 (18)	0.769	12 (15)	0.483
Obesity	365 (28)	0.579	23 (25)	0.579	18 (20)	0.113
Chronic lung disease	104 (8)	0.395	5 (6)	0.395	8 (9)	0.732

¹No vaccination reported = comparator group, P-values from Chi square or Fischer's Exact tests and Kruskal-Wallis
²Race/ethnicity missing for 80 in the vaccine not reported group, 6 in the partially vaccinated group, and 6 in the fully vaccinated group; "Other race" includes American Indian/Alaska Native, Pacific Islander, multiple race, and "other race"

Table 3. MIS-C Treatment and Outcomes of Persons with No COVID-19 Vaccination Reported Compared with Partially and Fully Vaccinated Persons

	No Vaccination Reported (n=1,305)		Partially Vaccinated (n=91)		Fully Vaccinated (n=89)	
	n (%)	p value ¹	n (%)	p value ¹	n (%)	p value ¹
ICU-level care ²	768 (59)	0.079	45 (50)	0.079	40 (45)	0.010
Hospital length of stay, median, IQR (days)	5 (4-7)	0.514	5 (3-7)	0.514	5 (3-7)	0.133
ICU length of stay, median, IQR (days)	3 (2-5)	0.944	3 (2-5)	0.944	3 (1-4)	0.196
Death	21 (2)	0.223	0 (0)	0.223	0 (0)	0.228

¹No vaccination reported = comparator group, P-values from Chi square or Fischer's Exact tests and Kruskal-Wallis
²ICU admission on case report form or receipt of invasive ventilation, vasopressors, or ECMO

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