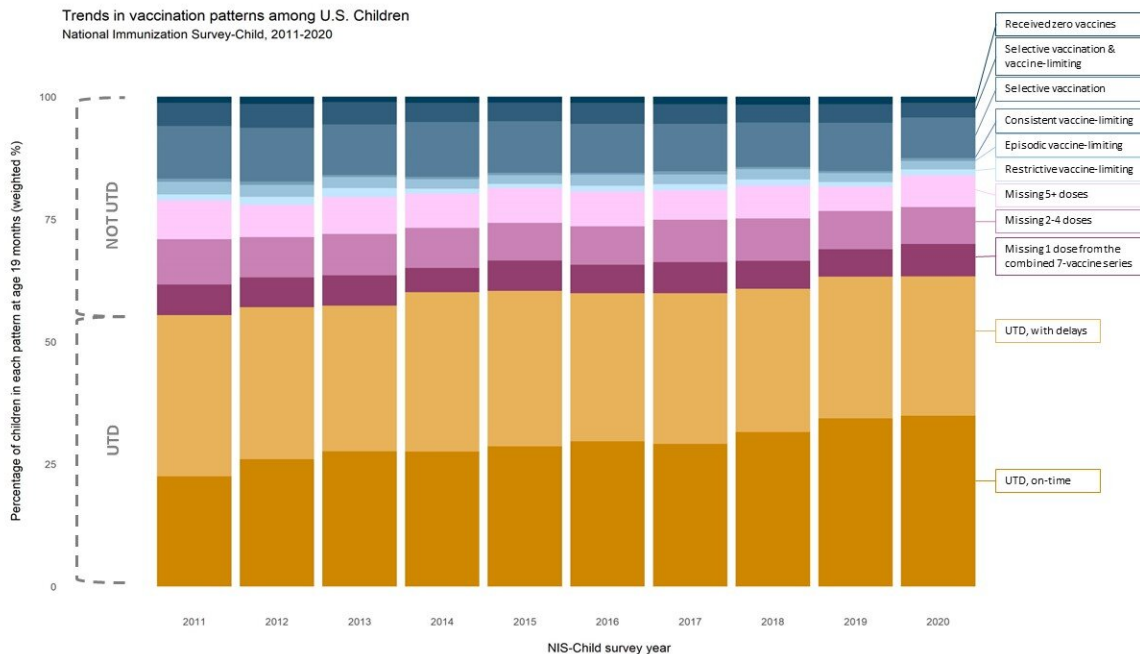


# Adherence to pediatric vaccine recommendations on the rise

April 28 2023



The percentage of children under 19 months who received all recommended vaccines on-time steadily improved from 22.5% in 2011 to 34.9% in 2020, according to a new national study. The research will be presented at the [Pediatric Academic Societies \(PAS\) 2023 Meeting](#), held April 27-May 1 in Washington, D.C.

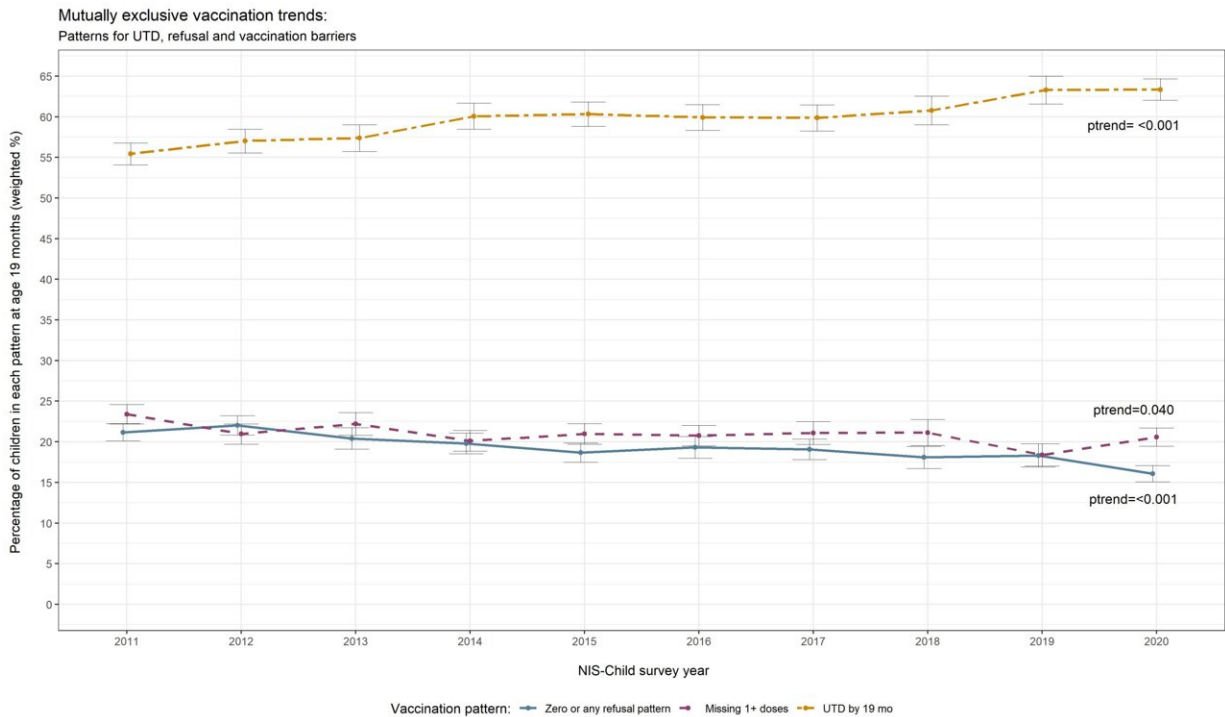
Researchers examined 161,187 child vaccination records over a 10-year period for the combined seven-[vaccine](#) series of diphtheria, pertussis, tetanus, poliovirus, measles, mumps, rubella, hepatitis B, Haemophilus influenzae type b, varicella, and pneumococcal infections. The records came from the National Immunization Survey-Child (NIS-Child), administered by the Centers for Disease Control and Prevention. The researchers measured whether children got vaccines on-time and in the order recommended on the U.S. immunization schedule.

The study noted a significant decline in children who were undervaccinated from 2011-2020. Causes for undervaccination may include parental [vaccine](#) refusal or barriers to accessing vaccination services.

Despite improvement in overall rates, findings show the number of [children](#) who consistently received zero vaccinations held steady at 1.2% during the study period.

**Table 1.** Weighted percent and 95% confidence intervals of hierarchical, mutually exclusive patterns of vaccination for the combined 7-vaccine series by survey year.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	p-trend
No vaccines	1.2 (1.0, 1.5)	1.4 (1.0, 1.8)	1.1 (0.7, 1.4)	1.2 (0.9, 1.5)	1.2 (0.9, 1.4)	1.2 (1.0, 1.4)	1.5 (1.2, 1.7)	1.6 (1.3, 1.9)	1.5 (1.2, 1.8)	1.2 (1.0, 1.5)	0.289
Selective vaccination plus shot-limiting	4.7 (4.3, 5.2)	4.9 (4.3, 5.5)	4.6 (4.0, 5.1)	3.9 (3.4, 4.4)	3.8 (3.2, 4.4)	4.3 (3.5, 5.1)	4.0 (3.4, 4.7)	3.7 (2.9, 4.4)	3.9 (3.0, 4.7)	3.0 (2.6, 3.5)	0.002
Selective vaccination	10.8 (9.9, 11.6)	11.0 (10.1, 11.9)	10.3 (9.3, 11.3)	11.2 (10.1, 12.3)	10.6 (9.6, 11.5)	10.0 (9.0, 11.0)	9.7 (8.8, 10.5)	9.1 (8.1, 10.1)	9.8 (8.8, 10.9)	8.3 (7.5, 9.1)	0.002
Consistent shot-limiting	0.6 (0.4, 0.8)	0.7 (0.5, 0.9)	0.4 (0.3, 0.6)	0.5 (0.3, 0.6)	0.5 (0.3, 0.6)	0.4 (0.2, 0.5)	0.7 (0.3, 1.1)	0.5 (0.3, 0.6)	0.4 (0.2, 0.6)	0.6 (0.4, 0.8)	0.469
Episodic shot-limiting	2.6 (2.2, 3.1)	2.4 (2.0, 2.9)	2.3 (1.8, 2.7)	2.0 (1.5, 2.4)	1.8 (1.4, 2.2)	2.3 (1.8, 2.8)	2.0 (1.4, 2.5)	2.1 (1.5, 2.7)	1.8 (1.2, 2.4)	1.7 (1.4, 2.1)	0.008
Restrictive shot-limiting	1.2 (1.0, 1.5)	1.6 (1.2, 2.0)	1.8 (1.3, 2.3)	1.0 (0.7, 1.3)	0.9 (0.5, 1.2)	1.2 (0.8, 1.5)	1.2 (0.9, 1.5)	1.2 (0.9, 1.5)	0.9 (0.6, 1.2)	1.2 (0.9, 1.5)	0.207
Missing 5+ vaccine doses	7.9 (7.1, 8.7)	6.6 (6, 7.3)	7.6 (6.7, 8.5)	7.0 (6.1, 7.9)	7.1 (6.3, 7.9)	7.1 (6.4, 7.9)	6.0 (5.3, 6.8)	6.8 (5.8, 7.8)	5.0 (4.4, 5.7)	6.4 (5.7, 7.2)	0.021
Missing 2-4 vaccine doses	9.2 (8.5, 10.0)	8.2 (7.4, 9.1)	8.5 (7.5, 9.4)	8.2 (7.3, 9.0)	7.7 (6.9, 8.5)	7.9 (7.0, 8.7)	8.7 (7.5, 9.8)	8.7 (7.6, 9.8)	7.8 (6.8, 8.8)	7.5 (6.8, 8.2)	0.110
Missing 1 vaccine dose	6.2 (5.6, 6.9)	6.1 (5.4, 6.8)	6.1 (5.3, 7.0)	5.0 (4.4, 5.6)	6.2 (5.5, 7.0)	5.8 (5.0, 6.6)	6.4 (5.7, 7.1)	5.7 (4.9, 6.4)	5.6 (4.7, 6.5)	6.6 (5.9, 7.3)	0.898
Up-to-date, some vaccines late	32.9 (31.6, 34.2)	31.0 (29.7, 32.4)	29.8 (28.3, 31.3)	32.5 (30.9, 34.1)	31.7 (30.3, 33.2)	30.3 (28.8, 31.7)	30.8 (29.2, 32.3)	29.3 (27.7, 30.8)	29.0 (27.4, 30.5)	28.5 (27.2, 29.7)	0.008
Up-to-date, no vaccines late	22.5 (21.4, 23.6)	26.0 (24.7, 27.2)	27.6 (26.2, 29.0)	27.5 (26.1, 29.0)	28.6 (27.3, 29.9)	29.7 (28.2, 31.1)	29.1 (27.8, 30.5)	31.5 (30.0, 33)	34.3 (32.7, 35.9)	34.9 (33.6, 36.1)	<0.001



"The study results show that adherence to national guidelines for childhood vaccination has been steadily improving," said Sophia R. Newcomer, Ph.D., MPH, associate professor at University of Montana Center for Population Health Research and presenting author. "The national data not only underscores the need to continue to boost on-time vaccination but offers important context for the state of childhood vaccines in the United States."

Researchers estimate pediatric vaccinations during the pandemic and COVID-19 vaccination patterns will likely differ, urging additional data collection and analysis to guide future public health efforts.

Provided by American Pediatric Society

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