EPH221

Anti-ish Vaccination: Patterns of Childhood Vaccine Uptake in the First 24 Months in Children Vaccinated or Not for Measles/Mumps/Rubella

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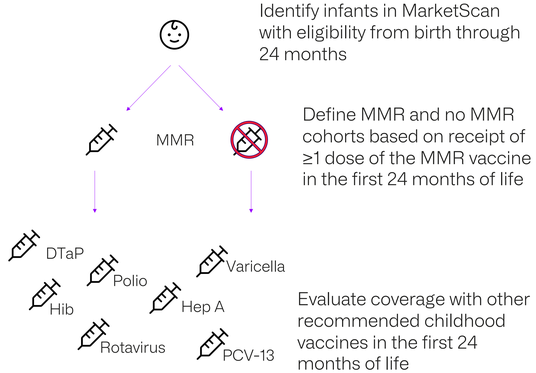
MarketScan

Study Summary

Study Question: How does measles/mumps/rubella vaccination status influence uptake of other childhood vaccines?

Study Design:

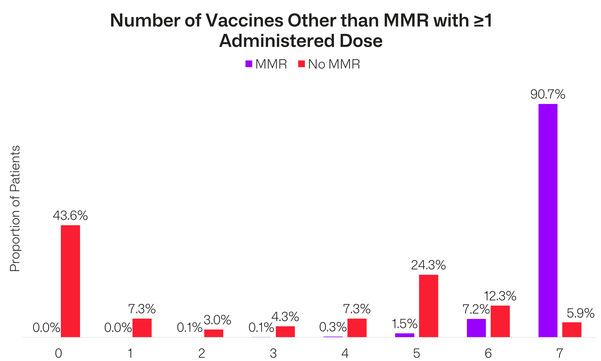


Identify infants in MarketScan with eligibility from birth through 24 months

Define MMR and no MMR cohorts based on receipt of ≥1 dose of the MMR vaccine in the first 24 months of life

Evaluate coverage with other recommended childhood vaccines in the first 24 months of life

Study Results:



Conclusion: Although there are strong associations between MMR vaccination and uptake of other childhood vaccines, the relationship was not absolute, with over 50% of children in the non-MMR cohort receiving ≥1 dose of another vaccine.

Background

- Vaccine hesitancy has been on the rise globally due to vaccine misinformation, eroding public trust in government organizations, policy changes - including increased opportunities for exemptions and changes to the recommended vaccine schedule - and perceived risk of vaccination versus risk of disease.[1]
- The measles, mumps, and rubella (MMR) vaccine has taken the brunt of anti-vaccine rhetoric, despite its long-established safety and efficacy profile.
- Measles vaccination coverage has declined in recent birth cohorts, and measles cases have been on the rise in the US with 4,451 measles cases from 2000 to 2024 and 15 outbreaks in 2024 alone[2,3]

Methods

- The MarketScan® Commercial Database from January 1, 2017 through June 30, 2024, were used for these analyses.
  - The MarketScan administrative claims databases contain data on the full healthcare experience (inpatient, outpatient, and outpatient pharmacy) and associated costs for individuals and their dependents with employer sponsored commercial insurance in the United States.
- Children with continuous eligibility with medical and pharmacy benefits were followed from birth to 24 months.
- MMR and No MMR cohorts were defined based on receipt of ≥1 dose of the MMR vaccine in the first 24-months of life; uptake of 7 different vaccines on the childhood vaccination schedule were assessed over the same period.
  - Vaccines included: diphtheria/tetanus/pertussis [DTaP], pneumococcal conjugate [PCV-13], polio, rotavirus, haemophilus influenzae type b [Hib], varicella, and hepatitis A [HepA]. Hepatitis B was excluded as the first dose is given in the inpatient setting at birth; seasonal flu was also not assessed.
- Among vaccinated children the number of vaccine doses and timing of administration was also evaluated for each of the vaccines.

Objective

- To evaluate uptake of other recommended childhood vaccines at 24 months based on MMR vaccination status.

Results

- The majority of children (90.5%) qualified for the MMR cohort (Table 1).
  - Coverage is below the 92-94% threshold required for measles herd immunity.
- The proportion of patients in the No MMR cohort increased from 8.6% in 2018 to 11.8% in 2022.

Table 1. Sample Demographics

	MMR N=275,070		No MMR N=31,021	
	N/Mean	%/SD	N/Mean	%/SD
Sex (N, %)				
Male	140,948	51.2%	16,194	52.2%
Female	134,122	48.8%	14,827	47.8%
Region (N, %)				
New England	9,280	3.4%	7,154	23.1%
Mid-Atlantic	36,440	13.2%	2,547	8.2%
East North Central	45,715	16.6%	3,992	12.9%
West North Central	17,140	6.2%	1,496	4.8%
South Atlantic	85,883	31.2%	7,197	23.2%
East South Central	12,919	4.7%	1,071	3.5%
West South Central	27,231	9.9%	2,654	8.6%
Mountain	14,810	5.4%	2,089	6.7%
Pacific	23,163	8.4%	2,534	8.2%
Unknown/Missing	2,489	0.9%	287	0.9%
Index Year (N, %)				
2017	53,577	19.5%	5,935	19.1%
2018	49,459	18.0%	4,679	15.1%
2019	44,397	16.1%	4,832	15.6%
2020	40,267	14.6%	4,540	14.6%
2021	38,456	14.0%	4,509	14.5%
2022	48,914	17.8%	6,526	21.0%

Figure 1. Vaccination Coverage by MMR Status

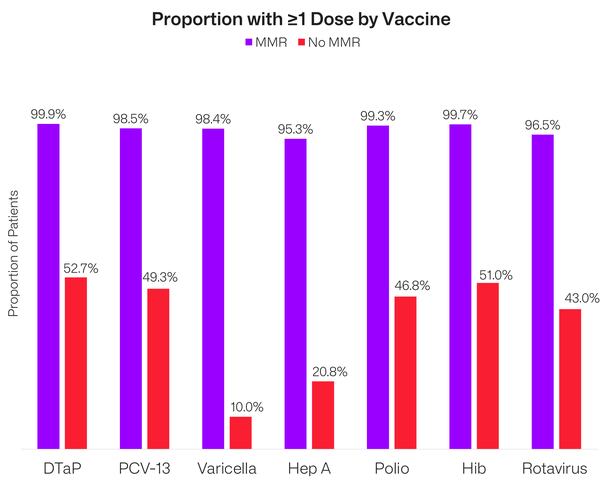
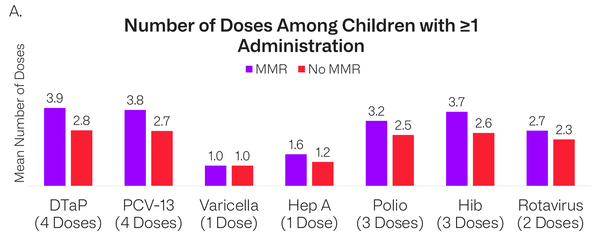
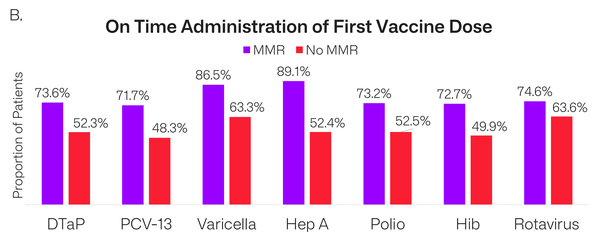


Figure 2. Vaccination Characteristics

A.



B.



Results

- Coverage for other, non-MMR vaccines was extremely high in the MMR cohort ranging from 95.3% for Hep A to 99.9% for DTaP (Figure 1).
- Coverage rates for other non-MMR vaccines were notably lower, although not absent, in the No MMR cohort (Figure 1).
  - The lowest rates of vaccination coverage were observed for varicella (10.0%).
  - Over 50% of patients received ≥1 DTaP and Hib vaccine administration; rates of vaccination were over 40% for PCV-13, polio, and rotavirus.
- Among children in the MMR and No MMR cohorts with ≥1 administration for a non-MMR vaccine, the No MMR cohort had a lower mean number of vaccine administrations and a lower proportion of patients with on time administration based on recommended vaccination schedules (Figure 2A-B).
  - On average, vaccinated children in the No MMR cohort received multiple doses where recommended (Figure 2A).
  - Despite reduced rates of timely vaccination, approximately 50% of vaccinated children in the No MMR cohort received the first dose on time (Figure 2B).

Limitations

- Administrative claims data do not include information on vaccination intent or reason for lack of vaccination; thus, results reflect incurred healthcare services.
  - No differences in claims related to immunocompromised status, vaccine reactions, vaccine-related illnesses, or pre-term birth were observed between cohorts (data not shown).
- Vaccination programs such as the US Vaccines for Children program may not be fully reflected in administrative claims data.
  - Although, it's possible that vaccination rates are under-reported in claims, this is less likely in a commercially insured population.

Conclusions

- Children vaccinated with MMR were more likely to have received other recommended childhood vaccines by 24 months and be vaccinated on time compared to children in the No MMR cohort.
- Results within the No MMR cohort show that vaccination decisions are not absolute, as over 60% of children received ≥1 dose of another recommended childhood vaccine and over 40% received ≥1 dose for at least 5 of the 7 vaccines assessed here.
- Further research is needed to better understand vaccination decision-making in pediatric populations and increase vaccination coverage in the US.

References

1. Opel DJ et al. Lancet. 2023;401L75-78., 2. Hill HA, et al. MMWR Morb Mortal Wkly Rpt. 2024;73:844-853., 3. Bednarczyk RA, et al. Public Health Reports. 2025;

Disclosure

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