

Rotavirus Immunization and the Medical Home: A Community Study

Lillianne Lewis MD, MPH; Fatima Ali MPH; Victoria Churchill MPH; Lilly Immergluck MD, MS, FAAP

Background

- Rotavirus is the leading cause of severe diarrheal disease
- Globally accounts for ~500K deaths/year in children under 5 years
- Caused 3 million infections with greater than 400K doctor visits, 200K ER visits, and 70K hospitalizations per year in the US (pre-vaccine)

Vaccines

- RotaTeq® (RV5, Merck, 2006) 3-dose series (2,4,6 months)
- Rotarix® (RV1, GlaxoSmithKline, 2008) 2-dose series (2,4 months)



- Vaccination series must be completed before 8 months, 0 days of age

Study Aim

To examine the relationship between rotavirus immunization status and number of vaccination providers among a population of children living in the metro Atlanta area.

Hypothesis

Primary

Children with inadequate rotavirus vaccination have more vaccination providers compared to children with complete rotavirus vaccination.

Secondary Hypothesis

Children with incomplete rotavirus vaccination live further from a listed vaccination provider (proxy: primary care provider) compared to children with completed rotavirus vaccination.

Study Design

Secondary Data Analysis

Original Study: Children presenting with Gastroenteritis between January-June in 2010 & 2011 at Children's Healthcare of Atlanta Hospitals

Categories: Rotavirus Case-Subjects & Rotavirus-Negative Controls + 2nd Control Group from Georgia Immunization Registry (GRITS)

Proxy: Rotavirus Vaccination Coverage & Utilization of Primary Care Provider (PCP)/ Medical Home

Definitions of Rotavirus Vaccination

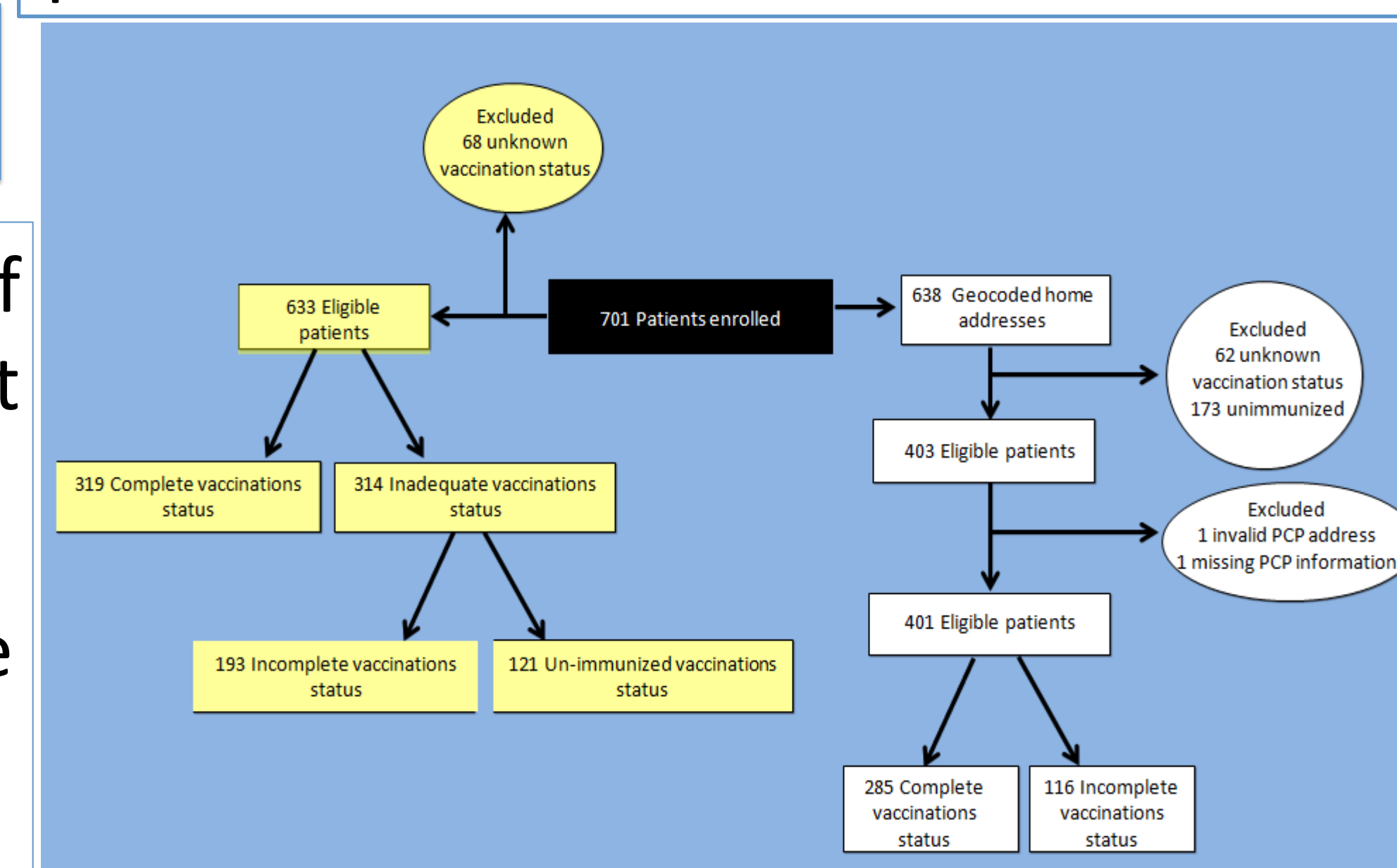
COMPLETE: Received recommended # of doses of RV5 or RV1 or mixed based on age at presentation

INCOMPLETE: Insufficient doses based on age

INADEQUATE: Incomplete + Unimmunized

Methods

- Univariate and multivariate analyses were conducted using SAS ver.9.4.
- Logistic regression models were used to determine crude and adjusted odds ratios.
- Adjusted models included all significant variables ($p < 0.05$) from descriptive, univariate analysis.
- ArcGIS ver.10.2 was used to geocode patient home addresses and provider address where rotavirus vaccination was received as determined by patient report and medical records.
- Spatial analyses were performed investigating distance between home and provider based on vaccination status.



Results

Table 1. Descriptive Characteristics According to Vaccination Status

	Complete N (%)	Inadequate N (%)	P (X ²)
Age	319 (50.4)	314 (49.6)	
0-3 months	17 (5.3)	13 (4.1)	
4-6 months	56 (17.6)	33 (10.5)	
7-9 months	61 (19.12)	51 (16.2)	
10-12 months	43 (13.5)	40 (12.7)	
13-23 months	85 (26.7)	108 (34.4)	0.0453*
24+ months	57 (17.9)	69 (22.0)	
Race			
White	93 (29.2)	66 (21.0)	
Black	163 (51.1)	211 (67.2)	0.0006*
Other	41 (12.9)	27 (8.6)	
None	8 (2.5)	2 (0.6)	
Unknown	14 (4.4)	8 (2.6)	
Ethnicity			
Hispanic	81 (25.2)	33 (10.5)	
Non-Hispanic	235 (73.8)	279 (88.5)	<0.0001*
Unknown	3 (0.9)	2 (0.6)	
Sex			
Male	185 (58.0)	180 (57.3)	0.8648
Female	134 (41.9)	134 (42.7)	
Insurance			
Private	41 (12.9)	32 (10.2)	
Public	247 (77.1)	243 (77.4)	0.6477
None	27 (8.5)	27 (8.6)	
Unknown	4 (1.3)	12 (3.8)	
Daycare			
Yes	101 (31.2)	126 (40.1)	0.0257*
No	214 (67.1)	184 (58.6)	
Unknown	4 (1.3)	4 (1.3)	
Household Size			
≤ 2	185 (58.0)	158 (50.3)	
3-4	78 (24.5)	96 (30.6)	0.2261
5-10	51 (16.0)	56 (17.8)	
>10	3 (0.9)	4 (1.3)	
Unknown	2 (0.6)	0	
Ever Breastfed			
No	78 (24.5)	100 (31.9)	
Yes	237 (74.3)	212 (67.5)	0.0430*
Unknown	4 (1.3)	2 (0.6)	
Prematurity (<4 weeks early)			
No	292 (91.5)	276 (87.9)	0.1166
Yes	24 (7.5)	35 (11.2)	
Unknown	3 (0.9)	3 (1.0)	

*p ≤ 0.05

Table 2: Vaccination Provider by Vaccination Status

	Complete N (%)	Inadequate N (%)	P (X ²)
Primary Vaccination Provider	319 (50.4)	314 (49.6)	
Yes (1)	271 (85.2)	243 (82.7)	
No (>1)	47 (14.8)	51 (17.4)	<0.3869
# of Providers			
1	271 (41.7)	243 (25.4)	
2	46 (8.5)	44 (15.0)	
3	1 (0.2)	7 (2.4)	<0.0767

Table 3: Association between Inadequate Rotavirus Vaccination and Vaccination Provider

	Crude OR (95% CI)	Adjusted OR* (95% CI)
> 1 Vaccination Provider	1.21 (0.79-1.87)	0.95 (0.480-1.86)

*Model adjusted for age, race, ethnicity, rotavirus case, daycare attendance, breastfed

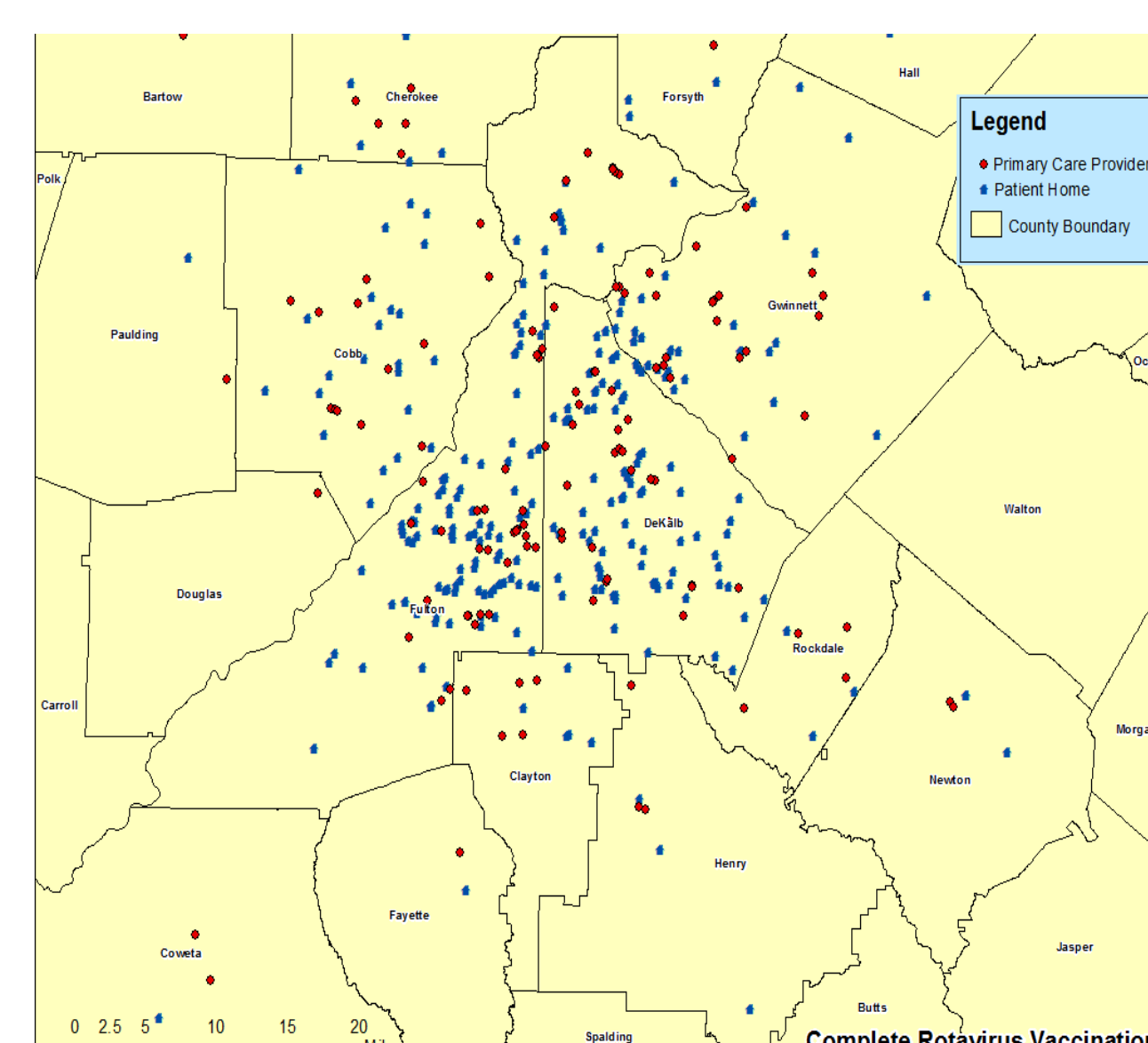
Discussion/Conclusion

Characteristics associated with immunization status include older age, Black race, non-Hispanic ethnicity, not attending daycare, and report of ever being breastfed. Though not statistically significant, Inadequately vaccinated kids had higher odds of having >1 vaccination provider (inverse relationship) and Incompletely vaccinated kids were more likely to be located >7 miles from a vaccination provider. Limitations include Recall Bias, Design Bias, & Sample Size. Future studies should investigate additional SES factors, the Built Environment and Transportation, Clustering Analyses, and Quality Improvement Projects for Increasing Vaccination Coverage and Access to the Medical Home

Results

Avg. distance between home and primary vaccination provider: **6.89 miles (complete) vs. 8.33 miles (incomplete).**
 Odds of living > 7 miles from PCP for Incomplete Rotavirus Vaccination: **1.38 (0.87-2.18)**

COMPLETE



INCOMPLETE

