Assessment of Missed Opportunities for Hepatitis A Vaccination, National Immunization Survey Child, 2013

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Introduction
• Hepatitis A virus (HAV) causes acute illness, typically by ingestion of food or water contaminated with fecal matter.
• 2013 incidence rate was 0.6 cases per 100,000 in U.S.
  ○ 1,781 cases reported to CDC (likely an underestimate)
• 1996 HAV vaccination introduced, provides immunity for 20+ years
  ○ 2006 ACP recommended routine vaccination for all children in U.S. at 1 year of age
• 3 vaccines available in the U.S.
  ○ One combination HAV/HBV vaccine administered as 3-dose series; only approved for use in adult population
• HAV vaccination is lagging behind that of other recommended vaccines; 2nd dose of sequence has lowest coverage level of all recommended childhood vaccines
• Childcare and school entry mandates for HAV vaccination vary widely
• Previous studies have indicated missed opportunities for vaccination (MOV) as a primary reason for underimmunization

Methods
• Cross-sectional analysis of data from 2013 National Immunization Survey Child (NIS-Child), available through CDC
• U.S. children 19-35 months of age, with provider verified vaccination history
• After restrictions, 13,460 (60%) of subjects retained for analysis

Data Sources and Study Population
• Cross-sectional analysis of data from 2013 National Immunization Survey Child (NIS-Child), available through CDC
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Data Analysis
• Analysis done using SAS v 9.4 (The SAS Institute, Cary NC)
• Survey procedures in SAS used to account for sampling methods in data collection and to assign sample weights

Vaccination eligibility determined using 2013 ACP dosing guidelines
• 1st dose at 12 months of age, 2nd dose 6-18 months after 1st dose
• MOV quantified by counting number of visits a child made to a health care facility to receive another vaccine and were eligible for HAV vaccination, but did not receive one
• MOV tallied and categorized into three levels:
  ○ Weighted frequency of each covariate of interest presented for restricted study population using PROC SURVEYFREQ
  ○ Cross-sectional associations of MOV with covariates, bivariate and multivariate polytomous logistic regression using PROC SURVEYLOGISTIC

Results
• Of the selected covariates of interest, only the distribution of gender & first birth status did not differ significantly across MOV categories
• Mean MOV were 0.77 per child (95% CI 0.74, 0.80)
  ○ 56.2% of children had 0 MOV
  ○ 22.1% of children had 1 MOV
  ○ 21.2% of children had 2 MOV
• Median age of vaccine initiation was higher among those with more MOV (Table 2)
  ○ Bivariate findings
    • Reduced odds for MOV associated with: younger age, younger mothers, receipt of WIC benefits, living below poverty line, living in Southern census region, living in a state with childcare or school entry mandates
    • Increased odds for MOV associated with: more educated mothers, married mothers
  • Multivariate findings are presented in Table 3

Discussion
• Children with 2+ MOV start the HAV vaccination series 6 months later than children with 0 MOV.
  ○ Gap in ability to protect these children and reduce further transmission of the virus
• Coverage for both doses still behind Healthy People 2020 targets for 85% coverage (Dose 1: 84.6%, Dose 2: 59.9%)
• Important to determine what is contributing to MOV
  ○ Parental refusal, alternate vaccine schedules, failure of providers to recognize vaccinating opportunities
• Implementing childcare and school entry mandates could help improve vaccination coverage

Strengths & Limitations
• Large sample size
  ○ Can be considered representative of U.S. children 19-35 months of age due to sampling methods
  ○ NIS-Child is only source that provides data at state/local level; able to assess association of childcare & school entry mandates with MOV
• MOV likely an underestimate since only other vaccinating visits were considered in the quantification
• Limited to variables in data set; unable to answer why children are having high numbers of MOV
• Restricted to children with provider verified vaccination history, omission of others may create bias

Conclusions
• Opportunities exist to improve vaccination coverage for HAV
  ○ Children are frequently seen in health care facilities when they are eligible for HAV vaccine, but it is not being administered
  ○ Health care providers need to take advantage of all encounters to ensure children receive all recommended vaccines