Multivariate Analyses of Socio-economic Inequities in Parental Awareness and Utilization of Meningococcal Serogroup B Vaccines

Liping Huang, MD, MA, MS[1] Amanda Dempsey, MD[2] Alex Galitsky[3], Mansour Fahimi, PhD[4] Amit Srivastava, PhD[1]
[1]Pfizer Inc, Collegeville, PA; [2]University of Colorado, Denver, CO; [3]GfK, New York, NY; [4]GfK, North Potomac, MD

OBJECTIVE

To examine factors associated with awareness and utilization of MenB vaccines for parents and caregivers of adolescents aged 16-19 years in the United States

BACKGROUND

- Serogroup B was the leading cause of meningococcal disease among US 16-23 year-olds , representing 60% of cases in 2016.[1]
- While two MenACWY and two MenB vaccines have been licensed by the FDA, only MenACWY vaccines are recommended by the ACIP for all 11 year olds (Category A), with a booster at 16 years. In contrast, Men B vaccines are recommended for 16-23 years olds based on individual clinical decision making (Category B).
- Recent published studies indicated that:

❖ HCP recommendation is critical for parent and caregiver vaccine awareness

C.S. Mott Children's Hospital, University of Michigan conducted a national survey in January 2017, showing that more than 1 out of 3 parents did not know when or if their teen was due for another vaccine and named the HCP's office as the primary information source for knowing when teen vaccines are due.[3]

❖ HCPs have a poor understanding of ACIP Category B recommendations

In a nationally representative sample of pediatricians surveyed between October and December of 2016, 64% reported understanding the difference between a Category A and Category B ACIP recommendations; however, 73% of these pediatricians incorrectly defined a Category B recommendation.[4]

Figure 1: Parents expect HCPs to guide them on teen vaccines

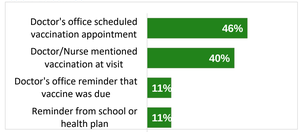
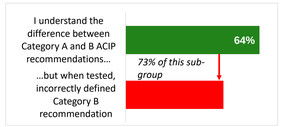


Figure 2: Category B recommendation is poorly understood by pediatricians



METHODS

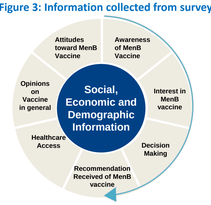
Who?
- An online quantitative survey was fielded among a nationally representative sample of US parents of adolescents aged 16–19 years recruited from GfK's KnowledgePanel®(KP).
- Inclusion criteria:
  - Agreement to confidentiality statement
  - English or Spanish speaking respondent aged over 18 years
  - Respondents are parents or guardians of at least one dependent aged 16-19 years

How?
- A structured quantitative, 25-minute self-administered online questionnaire with a short screening survey to determine eligibility was conducted.
- For self-reported vaccinated respondents, MenB vaccination verification through EMRs or HCPs was performed.
- Sample weights were adjusted to known population distributions obtained from the Current Population Survey (CPS) age 35+ along pre-specified dimensions: gender, race/ethnicity, geographic region, education attainment, household income and language proficiency.
- Univariate analysis was conducted to describe factors in relation to MenB vaccine awareness and use (logistic procedure in SAS version 9.4)
- Logistic regression models and Classification And Regression Trees (CART) were conducted to examine most influential factors associated with MenB vaccine awareness and utilization; special procedures were used to incorporate survey weights.

When?
- December 9-28, 2016

What?

Figure 3: Information collected from survey

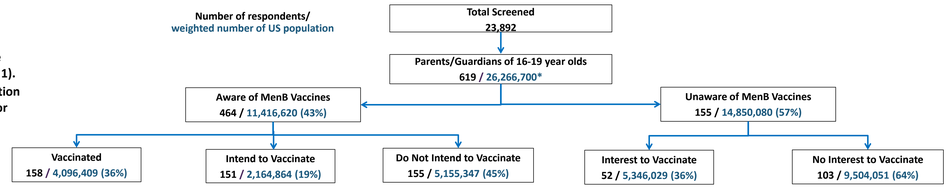


What is KnowledgePanel®?
- KP is GfK's online panel representative of the US population for which probability-based methods are used for recruitment. This panel is routinely used for government and academic research purposes to support publications in peer-reviewed journals.
- Samples from KP cover all households, including those without Internet access, as members from such households are furnished with a free tablet and Internet service.
- Social, economic and demographic factors potentially associated with awareness, access to care, decision making, and vaccine use were collected.

RESULTS

- Of the 23,892 screened for participation in the survey, 619 qualified to participate.
- Of the weighted sample, 57% were unaware of MenB vaccines (Figure 1).
- 57% of respondents MenB vaccination status was verified through EMRs or HCPs.

Figure 4: Flow chart of study population



Highlighted Results From Logistic Regression Models (Table 1)

Aware vs Not aware

57% were unaware of MenB vaccines

- Males
- Hispanic or non-white
- Lower educational attainment
- HCPs don't know children well

Vaccinated / Intend to Vaccinate vs. Do Not Intend to Vaccinate

45% were aware but do not intend to vaccinate

- Didn't receive recommendation from HCP
- HCPs don't know children well

Vaccinated vs. Intend to Vaccinate but not yet vaccinated

28% were aware and intend to vaccinate but not vaccinated

- Didn't receive recommendation from HCP
- Don't have employer-based medical insurance or no insurance

Unaware but Interested vs. Unaware Not Interested

36% of unaware parents were interested in and looking for more information of MenB vaccines

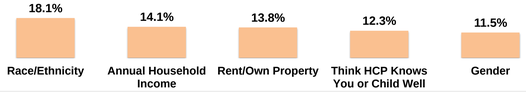
- Hispanic
- Aware of MenACWY vaccine

Table 1: Factors associated with MenB vaccine awareness or utilization from Logistic Regression Models

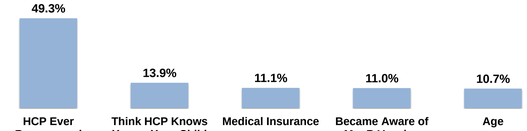
Category	Odds Ratios and Associated 95% Confidence Intervals from Survey* *statistical significance (p-value < 0.05)*			
	Aware of MenB Vaccines v. Unaware	Vaccinated/Intend to Vaccinate v. Not Intend to Vaccinate	Vaccinated v. Intend to Vaccinate	Unaware and Interested v. Not Interested
Age	1.00 (0.97, 1.04)	1.01 (0.98, 1.04)	1.00 (0.96, 1.03)	1.02 (0.95, 1.09)
Gender: Male v. Female	***0.43 (0.26, 0.70)****	1.09 (0.64, 1.84)	0.60 (0.30, 1.21)	0.40 (0.13, 1.24)
Hispanic v. Black and Others, Non-Hispanic	1.01 (0.47, 2.18)	0.66 (0.26, 1.71)	1.11 (0.39, 3.14)	***5.05 (1.13, 22.63)****
White, Non-Hispanic v. Black and Others, Non-Hispanic	***2.20 (1.09, 4.46)****	0.54 (0.25, 1.15)	1.17 (0.51, 2.71)	1.39 (0.29, 6.69)
Education: High School or below v. Some college or above	0.61 (0.34,1.09)	0.97 (0.54, 1.72)	1.13 (0.55, 2.29)	1.07 (0.33, 3.48)
Property: Rent v. Own	1.25 (0.67, 2.31)	1.18 (0.60, 2.33)	1.67 (0.67, 4.18)	1.79 (0.49, 6.49)
Annual Household Income	0.91 (0.69, 1.20)	0.93 (0.71, 1.21)	0.82 (0.55, 1.23)	1.70 (0.99, 2.92)
Insurance: Employed-Based v. No Insurance	0.71 (0.29, 1.72)	1.10 (0.38, 3.14)	***3.34 (1.09, 10.21)****	0.89 (0.19, 4.26)
Insurance: Medicaid v. No Insurance	0.47 (0.16, 1.35)	0.32 (0.09, 1.12)	1.56 (0.34, 7.15)	1.28 (0.16, 10.32)
Insurance: Others v. No Insurance	0.44 (0.16, 1.18)	0.99 (0.31, 3.13)	***3.66 (1.06, 12.66)****	1.67 (0.29, 9.66)
Awareness of MenB Outbreaks: No v. Yes	0.96 (0.59, 1.55)	0.88 (0.42, 1.84)	1.10 (0.51, 2.37)	0.58 (0.11, 3.13)
Awareness of MenACWY Vaccine: Yes v. No	0.52 (0.23, 1.19)	1.36 (0.80, 2.32)	1.02 (0.55, 1.90)	***3.02 (1.03, 8.81)****
Generally see the same HCP: No v. Yes	0.76 (0.40, 1.45)	0.76 (0.32, 1.81)	***3.34 (1.29, 8.62)****	1.79 (0.57, 5.68)
Think HCP knows you or your child well: No v. Yes	***0.53 (0.30, 0.96)****	***0.43 (0.20, 0.93)****	0.85 (0.32, 2.29)	0.28 (0.07, 1.05)
HCP ever recommended MenB Vaccine: Yes v. No	N/A	***4.81 (2.46, 9.35)****	***5.66 (2.49, 12.87)****	N/A
First became aware of MenB vaccine via HCP: Yes v. No	N/A	1.29 (0.70, 2.39)	0.64 (0.30, 1.33)	N/A

Figure 5: Most influential variables generated from classification/regression trees (CART) to predict awareness and MenB vaccine utilization

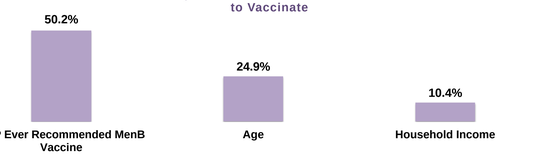
CART 1: Status of Aware of MenB Vaccine v. Not Aware



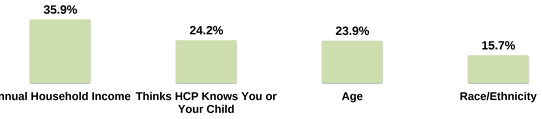
CART 2: Status of Being Aware of MenB Vaccine and Vaccinated/Intent to Vaccinate v. Not Intend to Vaccinate



CART 3: Status of Being Aware of MenB Vaccine and Vaccinated v. Intend to Vaccinate



CART 4: Status of Being Unaware of MenB Vaccine and Interested v. Not Interested



- Race/ethnicity and household income were key factors in predicting awareness of MenB vaccine (CART 1) and lack of awareness, but interested (CART 4).
- HCP recommendation was the most influential factor to predict the MenB vaccination status (CART 2 & 3).
- Results from CART are consistent with results observed from logistic regression models.

CONCLUSIONS

- Provider discussion and recommendation remain the most significant catalyst for MenB vaccine awareness and receipt, similar to other adolescent vaccines like HPV and MenACWY.
- There is evidence of racial and socioeconomic disparities in MenB awareness among the vaccine-eligible adolescent population in the United States.
- In the context of recently published studies that demonstrate substantial gaps in provider understanding, our data underscores the critical need for efforts to (1) improve knowledge and awareness of MenB vaccines (2) improve provider understanding of the ACIP Category B recommendation and (3) develop tools to aid consistent implementation of ACIP Category B recommendation for MenB vaccines, including cues for providers to initiate discussions with adolescent patients and utilizing CDC's immunization platforms.

REFERENCES AND DISCLOSURE

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