

Figure 1: Study Population Flow Chart

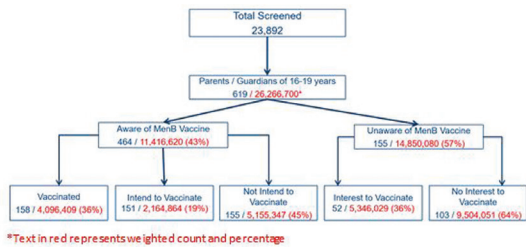
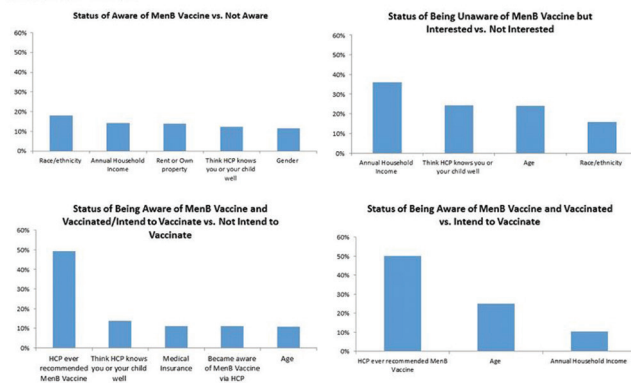


Table 1. Factors associated with MenB vaccine awareness or utilization from Logistic Regression Models

| | Odds Ratios and 95% Confidence Interval of Being | | | |
|--|--|--|------------------------------------|---|
| | Aware of MenB Vaccines vs. unaware | Vaccinated/Intend to vaccinate vs. Not intend to vaccinate | Vaccinated vs. Intend to vaccinate | Unaware but interested vs. not interested |
| Age | 1.00 (0.97, 1.04) | 1.01 (0.98, 1.04) | 1.00 (0.96, 1.03) | 1.02 (0.96, 1.08) |
| Gender: Male vs. Female | 0.83 (0.26, 2.70)* | 1.09 (0.64, 1.86) | 0.60 (0.30, 1.21) | 0.40 (0.13, 1.24) |
| Hispanic vs. Black and Others, Non-Hispanic | 1.05 (0.47, 2.38) | 0.66 (0.26, 1.71) | 1.11 (0.39, 3.14) | 5.95 (1.13, 32.01)* |
| White, non-Hispanic vs. Black and Others, Non-Hispanic | 2.20 (1.08, 4.66)* | 0.54 (0.21, 1.35) | 1.17 (0.51, 2.71) | 1.89 (0.29, 6.69) |
| Education: High school or better vs. Some college or above | 0.61 (0.34, 1.09) | 0.97 (0.54, 1.73) | 1.13 (0.52, 2.39) | 1.07 (0.33, 3.48) |
| Property: Own vs. Rent | 1.25 (0.67, 2.31) | 1.18 (0.62, 2.28) | 1.67 (0.67, 4.18) | 1.79 (0.48, 6.48) |
| Annual Household Income (Continuous variable) | 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: Employer-based vs. No insurance | 0.71 (0.28, 1.72) | 1.10 (0.38, 3.14) | 3.24 (1.08, 10.21)* | 0.89 (0.18, 4.36) |
| Insurance: Medicaid vs. No insurance | 0.47 (0.16, 1.52) | 0.32 (0.09, 1.12) | 1.56 (0.34, 7.15) | 1.28 (0.16, 10.32) |
| Insurance: Others vs. 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 MenACWY vaccine: Yes vs. No | 0.96 (0.98, 1.00) | 1.96 (0.42, 1.86) | 1.10 (0.55, 1.99) | 0.98 (0.18, 8.81)* |
| Awareness of MenB outbreak: No vs. Yes | 0.52 (0.21, 1.19) | 0.88 (0.80, 2.32) | 1.02 (0.51, 2.07) | 3.02 (0.11, 11.31) |
| Generally see the same HCP: No vs. Yes | 0.76 (0.40, 1.45) | 0.76 (0.32, 1.81) | 3.84 (1.20, 8.63)* | 1.79 (0.27, 5.68) |
| Think HCP knows you or your child well: No vs. Yes | 0.51 (0.16, 0.96)* | 0.48 (0.16, 0.93)* | 0.89 (0.25, 2.37) | 0.28 (0.07, 1.05) |
| HCP ever recommended MenB vaccine: Yes vs. No | N/A | 4.81 (2.46, 9.35)* | 5.66 (2.48, 12.87)* | N/A |
| HCP became aware of MenB vaccine via HCP: Yes vs. No | N/A | 1.29 (0.76, 2.20) | 0.64 (0.30, 1.33) | N/A |

*Statistical significance with p-value < 0.05

Figure 2. Most Influential Variables Generated from Classification/Regression Tree (CART) to Predict MenB Vaccine Awareness and Utilization



Disclosures. L. Huang, Pfizer: Employee and Shareholder, Salary and Stocks. A. Dempsey, Pfizer, Merck: Scientific Advisor, Consulting fee. A. Galitsky, Pfizer: Collaborator, Research support. M. Fahimi, Pfizer: Collaborator, Research support. A. Srivastava, Pfizer: Employee and Shareholder, Salary.

2458. Disparities in Healthcare Providers' Interpretation and Implementation of ACIP's Meningococcal Vaccine Recommendations

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Background. Serogroup B is the leading cause of invasive meningococcal disease (IMD) in United States. Among 16–23 year olds, particularly for college students, serogroup B (MenB) disease is greater than serogroups C, W, and Y combined. ACIP recommends routine immunization with MenACWY vaccine (Category A) but a non-routine recommendation based on individual clinical decision-making for MenB vaccine (Category B). Contrasting ACIP recommendations may affect how healthcare providers (HCP) prescribe meningococcal vaccines. We aimed to understand HCPs' decision process and vaccination practice pattern to prescribe meningococcal vaccines in relation to their experience and interpretations of ACIP recommendations.

Methods. A web-based survey was conducted during August–October 2017 among a nationally representative HCP sample. Univariate analyses were conducted.

Results. Of 529 HCP participants, 436 (82.4%) self-identified as prescribers of MenB only or both meningococcal vaccines, and 93 (17.6%) as prescribers of MenACWY vaccine only (Table 1). When HCPs were asked to rank the most impactful factor in their decision process, 45% ranked guideline considerations as the highest in their decisions to prescribe MenACWY to 16 year olds, followed by disease related factors (36%). For MenB vaccine, 40% ranked disease related factors as the highest, followed by guideline considerations (37%); however, contrasting to MenACWY vaccine (45% vs. 24%), there was no difference (37% vs. 38%) regarding how guideline considerations drove the decision

to prescribe or not to prescribe MenB vaccine (Table 2). Overall, HCPs interpreted ACIP's MenACWY recommendation more uniformly than the MenB recommendation (Figure 1) with majority interpreting MenACWY vaccine as for everyone, whereas MenB was split into for everyone or for a sub-group based on risk factors; ~1/4th of MenACWY only prescribers did not know how to interpret the MenB recommendation.

Conclusion. The ACIP MenB vaccine recommendation is inconsistently interpreted across HCPs and might affect their decision process and vaccination practice pattern to prescribe meningococcal vaccines resulting in disparities in access to MenB vaccines.

Table 1. Characteristics of HCP Participants

| | MenB only or both MenB & MenACWY Prescribers (N=436) ^a | MenACWY only Prescribers (N=93) ^b | p-value |
|--|---|--|--------------------|
| Male | 58.0% | 40.9% | 0.003 |
| Age group | | | |
| <35 | 11.5% | 20.4% | 0.020 |
| 35-44 | 31.7% | 32.3% | 0.909 |
| 45-54 | 31.2% | 25.8% | 0.305 |
| 55-64 | 23.2% | 12.9% | 0.000 |
| >65 | 2.5% | 8.6% | 0.004 ^c |
| Average % of Patients covered by type of insurance | | | |
| Commercial | 61.2% | 52.6% | 0.003 |
| Student plan | 6.4% | 4.4% | 0.052 |
| Medicaid/Gov. | 26.0% | 35.0% | 0.008 |
| Government/VA hospital | 4.4% | 1.6% | 0.161 |
| No insurance | 5.2% | 6.4% | 0.155 |
| Type of HCP | | | |
| PCP | 83.3% | 67.7% | 0.001 |
| NP | 10.6% | 23.7% | 0.001 |
| PA | 6.2% | 8.6% | 0.396 |
| Specialty | | | |
| Internal Medicine | 15.7% | 14.3% | 0.774 |
| Family practice | 15.4% | 30.2% | 0.005 |
| Pediatrics | 68.9% | 55.6% | 0.038 |

^aHCP who identified themselves as prescribing or recommending MenB only (n=5) or both MenB and MenACWY (n=431) vaccine
^bHCP who identified themselves as prescribing or recommending MenACWY (n=43) vaccine to their eligible adolescent or young adult patients regardless of whether the vaccine is administered in their office or somewhere else
^cThe minimum expected cell count in this subtable is less than one. Chi-square results may be invalid

Figure 1. HCPs' Interpretation of ACIP's Recommendations for MenB and MenACWY Vaccine

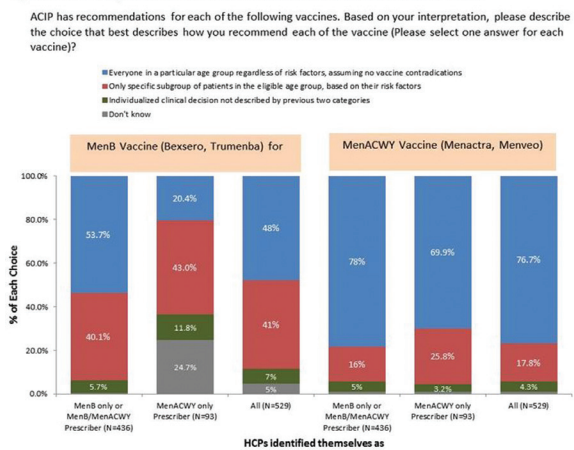


Table 2. Most impactful consideration in HCP's decision of prescribing MenB or MenACWY vaccine

| % of HCPs ranking the listed parameters as the most impactful in their decision | To Prescribe ^a | NOT to Prescribe ^b |
|---|---------------------------|-------------------------------|
| MenB Vaccine at 16 Years Old | | |
| N | 428* | 86** |
| Disease related factors | 40.0% | 12.8% |
| Patient related factors | 17.1% | 31.4% |
| Vaccine related factors | 2.8% | 7.0% |
| Guidelines considerations | 37.1% | 38.4% |
| Financial considerations | 1.6% | 8.1% |
| Vaccine access considerations | 1.4% | 2.3% |
| MenACWY Vaccine at 16 Years Old | | |
| N | 519* | 42** |
| Disease related factors | 36.4% | 23.8% |
| Patient related factors | 11.6% | 33.3% |
| Vaccine related factors | 4.2% | 2.4% |
| Guidelines considerations | 44.7% | 23.8% |
| Financial considerations | 0.8% | 7.1% |
| Vaccine access considerations | 2.3% | 9.5% |

^aThe question was asked "As you indicated you prescribe Meningococcal B vaccine or MenACWY booster dose usually, almost always, or sometimes to your adolescent patients age 16 through 18, how impactful is each of the following parameters in your decision of prescribing the vaccine? Please rank each of the listed parameters below in 1 (most impactful) to 6 (least impactful)"

^bThe question was asked "As you indicated you prescribe Meningococcal B vaccine or MenACWY booster dose upon request, rarely or never to your adolescent patients age 16 through 18, how impactful is each of the following parameters in your decision of NOT prescribing or recommending the vaccine? Please rank each of the listed parameters below in 1 (most impactful) to 6 (least impactful)"

*Based on the numbers of HCP who usually, almost always, and sometimes prescribed/recommended MenB vaccine or MenACWY booster dose and responded the question

**Based on the numbers of HCP who upon request, rarely or never prescribing MenB vaccine or MenACWY booster dose and responded the question

Disclosures. L. Huang, Pfizer: Employee and Shareholder, Salary and Stocks. A. Goren, Pfizer: Collaborator, Research support. L. Lee, Pfizer: Collaborator, Research support. A. Dempsey, Pfizer, Merck: Scientific Advisor, Consulting fee. A. Srivastava, Pfizer: Employee and Shareholder, Salary.

2459. Meningococcal ACWY (MenACWY) Vaccination of Adolescents in the United States: How Compliant Are We With the Advisory Committee on Immunization Practices (ACIP) Recommendations?

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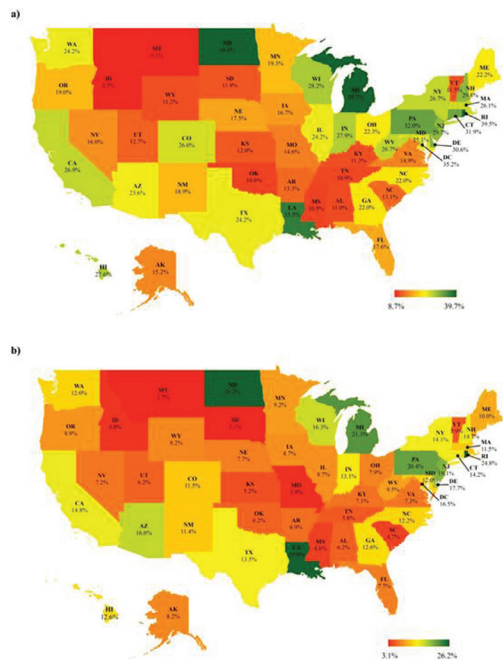
Background. Since 2011, ACIP guidelines for routine meningococcal ACWY vaccination (MenACWY) include a primary dose before age 16 (preferably at ages 11–12) and a booster dose (preferred age 16). Data on rates and drivers of meningococcal vaccination completion and compliance with ACIP recommendations down to state level are limited.

Methods. The 2011–2016 US National Immunization Survey-Teen data among adolescents aged 17 were used (GSK study identifier: HO-17-18202). National and state prevalence were estimated for MenACWY completion (receipt of primary dose at ages 11–15 and booster dose at age 16 or older) and compliance (receipt of primary dose at ages 11–12 and booster dose at age 16). Determinants such as state of residence, demographics, clinical/provider characteristics, vaccine mandates were assessed using multivariable logistic regression. Survey sampling weights were used to obtain population-based estimates.

Results. The estimated national average prevalence based on 2011–2016 data were 23.2% for MenACWY vaccine completion and 12.1% for compliance in US adolescents. Across states, prevalence varied from 8.7–39.7% for completion and 3.1–26.2% for compliance (Figure 1). Beyond state of residence, factors significantly associated with higher likelihood of both completion and compliance included being male, being up-to-date on other routine vaccines, having private or hospital-based vaccine providers (vs. public), and having >1 child in the household. Factors associated only with completion included having an 11- to 12-year-old well-child examination (OR [95% CI]: 1.5 [1.0–2.2]), >1 annual healthcare visit (2–5 vs. none) (1.4 [1.1–1.8]), and an existing state booster dose vaccine mandate (2.0 [1.5–2.8]) while factors associated with only compliance included history of asthma (1.3 [1.1–1.6]) and high-risk health conditions (1.4 [1.0–2.0]).

Conclusion. Adolescent completion and compliance rates for MenACWY vaccination in the United States are suboptimal, with significant variability across states. Determinants of completion and compliance with ACIP recommendations identified in this study may help guide clinical, policy, and educational interventions to promote healthcare access/utilization among adolescents in order to increase vaccine uptake.

Figure 1: MenACWY vaccination completion (a) and compliance (b). States with lowest and highest vaccination completion rates were Idaho and Michigan, respectively. States with lowest and highest vaccination compliance rates were South Dakota and North Dakota, respectively.



MenACWY, meningococcal vaccination against serogroups A, C, W and Y

Disclosures. W. Cheng, Analysis Group, Inc.: Employee, Research grant. R. Chang, Analysis Group, Inc.: Employee, Research grant. P. Novy, GSK: Employee, Salary. C. O'Connor, Analysis Group, Inc.: Employee, Research grant. M. S. Duh, Analysis Group, Inc.: Employee, Research grant. C. Hoge, GSK: Employee, Salary.

2460. Factors Associated With Uptake of Meningococcus B Vaccination After an ACIP Category B Recommendation

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Background. Two meningococcal vaccines (MenB) were licensed for 10–25 year olds in 2015 and given a Category B recommendation with a preferred window of 16–18 years old without high-risk comorbidity. Little is known about uptake of MenB after a Category B recommendation.

Methods. We conducted a retrospective cohort study of 16–23 year olds presenting to 31 primary care sites in a pediatric care network October 23, 2015–April 30, 2017. Using pivot tables and chi square analysis, we examined EHR data for associations between MenB receipt and patient/provider demographics (patient age, sex, race, insurance; provider years in practice), vaccinations, care site (urban vs. suburban), and high-risk comorbidity (asplenia, sickle cell, complement deficiency).

Results. Of 45,428 patients, 51% were female, 68% were 16–18 years old, and 21% received ≥1 MenB. 43% of those patients completed the 2-dose series. Rates of MenACWY booster receipt (32%) exceeded MenB, and 28% received both vaccines. A higher proportion of patients with ≥1 MenB were Asian, older, and privately insured (Table 1). More privately insured patients completed the series (48% vs. 26% Medicaid, $P < 0.001$). 22% of high-risk patients received MenB, similar to their peers. MenB receipt increased with provider years in practice but declined in those practicing >30 years (Table 1). MenB initiation varied widely between sites (1–45%).

Conclusion. MenB uptake in this cohort was low. Variation by site, provider years in practice, and potential sociodemographic disparity suggests that advice and acceptance in the setting of a Category B recommendation is not uniform. Further study is needed to clarify how these factors influence MenB receipt in teens.

Table 1: % 16–23 Year Olds With ≥1 MenB by Patient and Provider Characteristics

| | | Total (%) N = 45,428 | % with ≥1 MenB N = 9,393 | P-value |
|-------------------------|-----------------------|-------------------------|-----------------------------|---------|
| Sex | Female | 23,167 (51) | 21 | 0.31 |
| | Male | 22,261 (49) | 21 | |
| Age | 16–18 | 31,307 (69) | 18 | <0.001 |
| | 19–23 | 14,121 (31) | 28 | |
| Race | White | 26,280 (58) | 27 | <0.001 |
| | Black | 13,186 (29) | 18 | |
| | Asian | 1,237 (27) | 22 | |
| Insurance | Medicaid | 10,507 (23) | 17 | <0.001 |
| | Private | 34,854 (77) | 22 | |
| Vaccinations | MenACWY | 14,753 (33) | 28 | |
| | HPV | 10,007 (22) | 21 | |
| | Tdap | 619 (1.4) | 23 | |
| Comorbidities | Sickle cell | 543 (1.2) | 22 | |
| | Complement deficiency | 3 (0.007) | 33 | |
| | Asplenia | 19 (0.04) | 42 | |
| Prov. years in practice | ≤10 | 7,564 (24) | 16 | <0.001 |
| | 11–20 | 9,205 (29) | 18 | |
| | 21–30 | 9,330 (29) | 19 | |
| | >30 | 5,939 (17) | 12 | |
| Care site | Urban | 9,845 (22) | 21 | 0.09 |
| | Suburban | 35,583 (78) | 20 | |

Disclosures. All authors: No reported disclosures.

2461. Safety of Quadrivalent Meningococcal Polysaccharide Diphtheria Toxoid-Conjugate Vaccine in Adolescents

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