

VACCINE IMPLEMENTATION 2017

VACCINE IMPLEMENTATION: ALASKA 2017

By

Amanda Hulstine, BSN

A Project Submitted in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF SCIENCE

in

Nursing Science

University of Alaska Anchorage

May 2017

APPROVED:

Lisa Jackson, DNP, FNP- BC, RN, Committee Chair
Thomas Hendrix, Ph.D., RN, Committee Member

Barbara Berner, EdD, APRN, FNP-C, FAANP, Director
Department of School of Nursing

William Hogan, MSW
College of Health

Abstract

Bacterial meningitis is a serious disease that causes permanent dysfunction or death; adolescents and young adults carry the greatest risk. The national Advisory Committee on Immunization Practices (ACIP) has released vaccine recommendations that include incorporation of meningitis vaccine into the mandatory school vaccine schedule. Throughout the nation, much of legislative policy has made meningitis vaccination a requirement for public school attendance. Alaska does not have such policy; the purpose of the project was to address this policy need. A secondary project goal was to increase community awareness of bacterial meningitis. Project actions were divided into policy advocacy and community awareness. Policy advocacy included the development of a *Policy Brief to Persuade* designed for the Alaska legislative health care committee members. A legislative survey to assess willingness to incorporate a required meningitis vaccine schedule into existing Alaska vaccine policy was sent electronically with the policy brief. Community awareness interventions included the development of a *Meningitis Education Bundle* for healthcare professionals and a *Protect Alaska's Future* campaign. The education bundle was distributed to local health establishments on Prince of Wales Island and the campaign information was distributed at the 2017 Prince of Wales Community Health Fair. Project outcomes demonstrated a lack of response to the policy survey. Efforts must continue over time with a deliberate plan to gain legislative support for the incorporation of a meningitis vaccination schedule into existing Alaska vaccine policy, as recommended by the ACIP. Community awareness activities at the health fair were successful and should continue.

Table of Contents

Title Page	1
Abstract	2
Table of Contents	3
List of Figures	5
List of Tables	5
List of Appendices	6
Vaccine Implementation: Alaska 2017	7
Project Purpose, Aims, and Goals	8
Framework	9
Literature Review	9
Burden of Disease	9
Vaccine Characteristics	12
Attitude, Political, Legal & Ethical Considerations	13
Conformity of Programs	15
Equity of Distribution	17
Immunization Strategy	19
Use of Resources	19
Cost	20
Effectiveness Evaluation	21
Methods	21
Project Design	21

- Advocacy21
- Community Awareness22
- Professional Education.....23
- Data Collection23
 - Community Education Outcomes23
 - Professional Education Outcomes23
- Barriers and Challenges24
- Other Considerations24
- Human Subject Status25
- Project Outcomes25
 - Data Analysis25
 - Data Synthesis.....30
 - Dissemination30
 - Change in Practice30
 - Recommendations for Future Study31
- Conclusions.....32
 - Professional Standards32
 - Summary.....33
- References.....34
- Appendices.....37

List of Figures

	Page
Figure 1: US Meningitis Vaccine Mandate	16
Figure 2: Meningitis Prevention Mandates for Colleges & Universities.....	17
Figure 3: Question 1: Would you choose to vaccinate against meningitis?	28
Figure 4: Question 2: If yes, did the education that you received influence your decision to vaccinate?.....	28
Figure 5: Question 3: Would you support a required meningitis vaccine for children attending public school in Alaska?	29

List of Tables

	Page
Table 1: Survey Responses from Legislative Health Committee	26

List of Appendices

	Page
Appendix A: Survey to Legislative Health Committee	37
Appendix B: Survey to Community at 2017 POW Community Health Fair	38
Appendix C: 2017 POW Community Health Fair Meningitis Sticker	39
Appendix D: 2017 POW Community Health Fair Bumper Sticker	39
Appendix E: 2017 POW Community Health Fair Meningitis Reminder Magnets	40
Appendix F: 2017 POW Community Health Fair Meningitis Pens	41
Appendix G: 2017 POW Community Health Fair Meningitis Banner.....	42

Vaccine Implementation: Alaska 2017

Meningococcal disease is defined as a bacterial infection by *Neisseria Meningitidis* involving several subtype strains, referred to as serotypes of this bacteria. *Neisseria Meningitidis* overgrowth can manifest as meningitis, involving cerebral spinal fluid of the brain and spinal cord; as sepsis, involving a widespread blood stream infection with many adverse manifestations; or as pneumonia (Immunization Action Coalition [IAC], 2016). Serotypes A, B, C, Y, and W-are thought most responsible for causing meningitis and sepsis (Center for Disease Control and Prevention [CDC], 2014; IAC, 2016; National Meningitis Association [NMA], 2016). Serotypes B, C, and Y are most prevalent in the United States, Alaska, and the United States (US) military (Broderick et al., 2015). Meningitis illness develops rapidly without warning in healthy young individuals. Permanent neurologic dysfunction, musculoskeletal deformity, and death are catastrophic consequences of meningitis infection (CDC, 2017; NMA, 2016).

According to the Centers for Disease Control and Prevention's *Strategic Framework for Global Immunization* (2016), "vaccine preventable diseases (VPD) can be controlled, eliminated, or eradicated with vaccines and vaccine initiatives" (p.9). This was demonstrated by eradication of poliovirus infections in the United States following vaccine implementation. Meningitis is a life-threatening condition that does not have a uniform mandatory vaccination schedule in the US (CDC, 2016). According to Alaska's State Epidemiology Department, *Neisseria Meningitidis* is a public health emergency, which requires mandatory reporting of all suspected or confirmed cases (Department of Health and Social Services [DHSS], 2015).

In response to this public health emergency, 14 of 51 states (including the District of Columbia) developed a meningitis vaccine policy requiring that at least one dose of meningitis vaccine must be administered to a child by Grade seven (IAC, 2017). In addition, 15 of 51 states require students entering colleges or universities be educated about meningitis prevention (transmission and vaccination) (IAC, 2017). Twenty-two of 51 states require that students be educated about meningitis and provide proof of vaccination or a waiver. Currently, Alaska only requires students residing on university campuses be counseled on the benefits of vaccination; the decision to vaccinate is left optional (Alaska State Legislature, 2015).

Project Purpose, Aims, and Goals

Due to the high morbidity and mortality associated with meningococcal disease, the purpose of this project was to develop strategies to advocate for policy change for a mandatory meningitis vaccine schedule in Alaska. Project aim was to improve health for young Alaskans utilizing primary prevention strategies. The first goal involved increasing awareness of meningitis and prevention strategies available for Alaska. The second goal was to gain support for a mandatory meningitis vaccination schedule. Alaska should become the thirteenth state to mandate a meningitis vaccination in grades seven and twelve. Legislative support and successful mandate for a vaccination schedule for meningitis in the State of Alaska was a goal of this project.

Policy change efforts to mandate a meningitis vaccination schedule that included the first vaccine required in seventh grade and a booster dose administered no later than Grade twelve were developed. Additional mandates included a single vaccine for all students within higher education (university, vocational school, or otherwise) residing in campus housing. Proof of vaccination or waiver must also be a requirement of higher education. The project goal also

allowed for provisions that if a mandatory vaccine schedule for grades seven and twelve was not supported, the advocacy goal would focus on promoting students of higher education receiving at least one meningitis vaccination prior to on-campus living in the State of Alaska. This includes proof of vaccination or waiver.

Framework

Implementation of vaccine policy should follow a vaccine implementation framework. The CDC identified country ownership as a leading priority in promoting global health (CDC, 2016). Accountability begins on a state and national level first. As state and nationally driven initiatives contribute to uniformity, progress is then made towards achieving global health.

The CDC global vaccine initiative framework includes programs, surveillance, vaccine delivery, and financial considerations and was utilized as the main framework for this project. More detailed public health frameworks presented by Erickson et al. (2005) and Gonzalez-Lorenzo et al. (2014), coincide with the CDC's global immunization framework to a large degree. For the purposes of this project both frameworks were utilized as a comprehensive vaccine policy framework and included: burden of disease, vaccine characteristics, conformity of programs, equity of distribution, attitude/ political/legal/ ethical considerations, immunization strategy, effectiveness evaluation, cost, and use of resources (Erickson et al., 2005; Gonzalez-Lorenzo et al., 2014).

Literature Review

Burden of Disease

Bacterial meningitis is spread from direct contact (such as kissing, sneezing, and coughing) and prolonged close quarter contact, related to transmission via airborne droplets (CDC, 2015; NMA, 2016). An individual can carry the disease without showing signs of illness,

with *Neisseria* bacteria lying dormant in the oropharynx. These individuals are known as carriers (CDC, 2016). Adolescents and young adults (16 to 23 years of age) are the highest at-risk population for both asymptotically carrier status and for contracting meningitis (CDC, 2015; IAC, 2016; NMA, 2016). Environments such as schools, sports teams and dormitories have the potential to increase disease transmission.

Other risk factors for contracting bacterial meningitis include tobacco smoke exposure, being immunocompromised, and having a previous viral infection (IAC, 2016). Research authorities are also examining a link between contracting meningitis secondary to a mononucleosis infection. If this proves to be a substantial theory, that would make adolescents and young adults additionally more susceptible, as mononucleosis is also common in this age group.

According to the CDC, children 11 years and older are most afflicted by meningitis strains B, C, and Y, with two out of three cases occurring within these subtypes. Ten percent to 15% of subjects will die when infected with meningococcal disease. Astoundingly, 11% to 19% of individuals who survive will have lasting sequela such as deafness, nervous system dysfunction, limb amputation, and/or brain damage (CDC, 2015; NMA, 2016). The aftermath of the disease casts a monumental burden, entailing financial, emotional, and physical consequences.

Similar to tuberculosis, risk for acquiring bacterial meningitis is also heightened in tight-knit community settings where close quarter gatherings are common (CDC, 2015; IAC, 2016). Situations whereby multiple individuals occupy a single residence pose a similar risk. Increased risk for Alaska Natives can therefore be inferred due to the prevalence of communal potlatches and the occurrence of multiple families co-residing.

Serotypes B, C, and Y are the most frequently occurring strains in the United States (CDC, 2014; IAC, 2016; NMA, 2016). Serotypes A, B, C, Y, and W are thought most responsible for causing bacterial meningitis leading to sepsis. According to the Center for Disease Control and Prevention (2015), there were approximately 550 cases of meningitis reported in 2013. Of these cases, two out of three were reportedly caused by serotypes B, C or Y. This national serotype prevalence directly matches previously identified meningitis rates in children 11 years of age and older (CDC, 2014; IAC, 2016; NMA, 2016).

Vaccination has been proven to prevent meningococcal disease. Subsequently, a global vaccination initiative is underway (CDC, 2016). The Advisory Committee on Immunization Practices, the Centers for Disease Control and Prevention, the American Academy of Pediatrics, and the National Meningitis Association endorse routine administration of the Quadrivalent Meningococcal Vaccine as a primary means of prevention for children and young adults during the time they are most at risk for contracting bacterial meningitis.

Between the years of 2006 to 2013, 28 cases of bacterial meningitis were reported by the US military (Broderick et al., 2015). All but one case was caused by serotypes B, C, or Y. Since instituting a universal meningitis vaccination policy for all military personnel, rates of meningitis have decreased by more than 90%. The US military now considers routine vaccination against meningitis a standard of care.

In Alaska, since 2004, 39 cases of invasive meningitis were reported and primarily involved serotypes B, C, or Y (DHSS, 2015). The Alaska Department of Epidemiology has already deemed *Neisseria meningitis* a public health emergency. Despite the epidemiologic emergency, Alaska remains a meningitis vaccine optional state.

Vaccine Characteristics

The Quadrivalent Meningococcal Vaccine contains bactericidal antibodies to meningococcal antigens for serotypes most responsible for affecting school-aged children and young adults (A, C, Y, and W) (Woo & Robinson, 2016). Two versions of this vaccine technology are available; one unconjugated polysaccharide vaccine and a conjugated polysaccharide vaccine. Menomune is not conjugated while Menactra is conjugated. Menactra is delivered with Diphtheria Toxoid to improve immunology (CDC, 2016; Sanofi Pasteur Inc., 2014). Menactra has been approved for young children age nine months and older, while Menomune has been approved for children two years and older. Both are considered safe for routine administration. The protective qualities of Menactra are believed to extend up to five years, making a second booster dose midway in the at-risk period necessary (Sanofi Pasteur Inc., 2014).

The meningitis vaccine carries very few risks. Documented risks include localized site reactions such as tenderness, redness, and swelling and low-grade temperature (Sanofi Pasteur Inc., 2014; Sanofi Pasteur Inc., 2016; Woo & Robinson, 2016). Other documented reactions shared between both vaccines (influenced by age) include diarrhea, headache, appetite loss, and crying. Additionally, the Quadrivalent Meningococcal Vaccine may not provide adequate immunological response in some individuals, especially those immunocompromised (Sanofi Pasteur Inc., 2014; Sanofi Pasteur Inc., 2016). Adverse reactions associated with vaccination are also seen in persons with a history of Guillain-Barre syndrome. However, these occurrences are not adequate reasons to withhold or decline vaccination. Vaccination is contraindicated if the patient has a history of a previous allergic reaction to the meningitis vaccine or components. Standard vaccine administration includes examination of allergies, acknowledgement of past

medical history, and calculation of risk factors that prioritizes patient safety as followed with any routine vaccination.

Routine vaccination against B serotype is not advised (AAP, 2016; CDC, 2016). This vaccine is reserved for times of outbreak or when a patient presents with unique risks for contracting serotype B meningitis. Due to this recommendation, the decision to vaccinate against serotype B is provider discretion.

Attitude, Political, Legal, and Ethical Considerations

Despite efforts to improve vaccination rates, one-fifth of American children classified in the highest at-risk category have not received the meningitis vaccine (NMA, 2016).

Furthermore, given the lack of a universal meningitis schedule, less than 30% of children have received a booster dose extending immunity. Factors that may influence willingness to immunize include individual state policies, higher educational requirements of vaccination, and clinician/parental beliefs and attitudes towards the vaccine (Elam-Evans et al., 2014). For example, when school districts require proof of vaccination, inoculation rates improve and disease rates are subsequently reduced (Omer et al., 2009).

Policy makers may challenge a mandatory vaccination program due to ethical concerns of violating personal autonomy. However, as with other established vaccine mandates already in place (such as Tdap, MMR, and polio), parents maintain the right to decline vaccination due to personal or religious beliefs. As a result of this, the child may be unable to attend public school or may contract illness during periods of disease outbreak (Alaska Immunization Program, 2016).

According to Alaska Statute, all children entering into the public educational system providing education from preschool to the 12th grade must demonstrate proof of immunization

against diphtheria, tetanus, polio, pertussis, measles, mumps, hepatitis A, hepatitis B, rubella, and varicella (Alaska State Legislature, 2015). The decision to waive required vaccinations is acceptable only if vaccination is deemed more harmful than going without vaccination. This decision must be documented by a medical doctor, doctor of osteopathy, physician assistant, or advanced nurse practitioner licensed to practice in the State of Alaska. Vaccination waiver is also acceptable if the child has a signed affidavit by parent/guardian stating that vaccination is in direct violation of religious beliefs and membership pertaining to a certain denomination or church. A mandatory meningitis vaccination schedule would follow current legislative policy in this respect.

It's also likely that public fear surrounds a mandatory vaccination schedule. Much of this stems from inadequate distribution of vaccine information amongst the public. Misconceptions about vaccines exist; unfounded allegations such as vaccines causing autism have reduced vaccination rates (Omer et al., 2009). Vaccine refusal relating to personal belief rather than contraindication to vaccination increases the potential for disease outbreak.

Despite known efficacy of vaccines preventing disease, the meningitis vaccine continues to be optional. A mandatory vaccination schedule incorporated into the current Alaska State vaccination policy to reduce disease outbreak and prevent the morbidity and mortality associated with meningococcal illness is a public health priority. Advocacy for practice change that meets current standards of care is a professional responsibility. Political advocacy promotes health, wellness, and a means of preventing illness for patients, families and communities (American Association of Nurse Practitioners, 2012). Activism also advances the nurse practitioner's role and professional title beyond direct patient service. As outlined by the Master's Essentials for

the American Association of Colleges of Nursing (2011), this project integrated policy change, professional leadership, and quality improvement essentials for education.

Conformity of Programs

The Center for Disease Control and Prevention and the Advisory Committee on Immunization Practices, currently recommend the first dose of Quadrivalent Meningococcal Vaccine be administered between the ages of 11-12 years with a booster dose administered between 16-18 years (2016). There must be a minimum of four years separating the first and second dose of Menactra, although separation of five years when following the recommended vaccination schedule is considered ideal (Sanofi Pasteur Inc., 2014). Timing the vaccination in this way reduces meningococcal-related fatalities and life-long sequelae during the period the child is most at risk for disease (CDC, 2015; Elam-Evans et al., 2014; NMA, 2016). Furthermore, vaccination offers outbreak reduction to communities, protecting against serotypes C and Y, which have an increased national and state prevalence (CDC, 2015; IAC, 2016; NMA, 2016).

According to the Immunization Action Coalition (2017), 14 of 51 states (including the District of Columbia) report required meningitis vaccine policy with at least one dose of meningitis vaccine administered to a child by Grade seven. Delaware requires one dose administered by the ninth grade. Twelve of 51 states require at least one dose administered by Grade 7, with the final dose given by Grade 12. There was slight variation reported between states as to when the child receives the first vaccination. Some states reported either Grade 6 or Grade 7. State policies that were different from one another (administration of one dose vs. two doses) were divided into separate categories in order to prevent an over estimation of totals.

Alaska does not have a meningitis vaccination mandate in place. Figure 1 depicts the national status of states with regard to mandatory meningitis vaccine schedules.

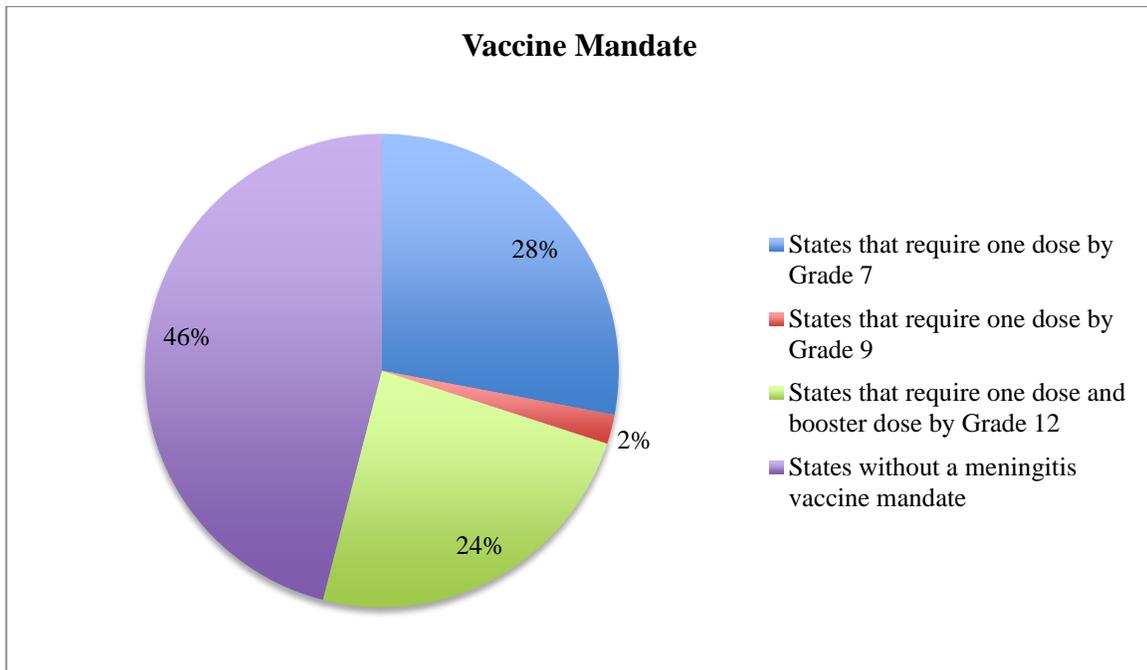


Figure 1. US meningitis vaccine mandate by state.

According to the Immunization Action Coalition (2017), 15 of 51 states require that students entering colleges or universities be educated only about meningitis prevention (transmission and vaccination). Twenty-two of 51 states require that students be educated about meningitis and provide proof of vaccination or a waiver. West Virginia requirements vary and are determined by each university separately. Slight variation exists between states that require all students to be educated as opposed to only those residing in campus housing. State policies that were different from one another (education only vs. education and proof of vaccination/waiver) were divided into separate categories in order to prevent an over estimation of totals. Alaska policy dictates that students attending college and universities are educated on meningococcal prevention. Proof of vaccination and/or acknowledgement of education materials

is required to attend college or reside in campus housing. Figure 2 summarizes the state education requirements.

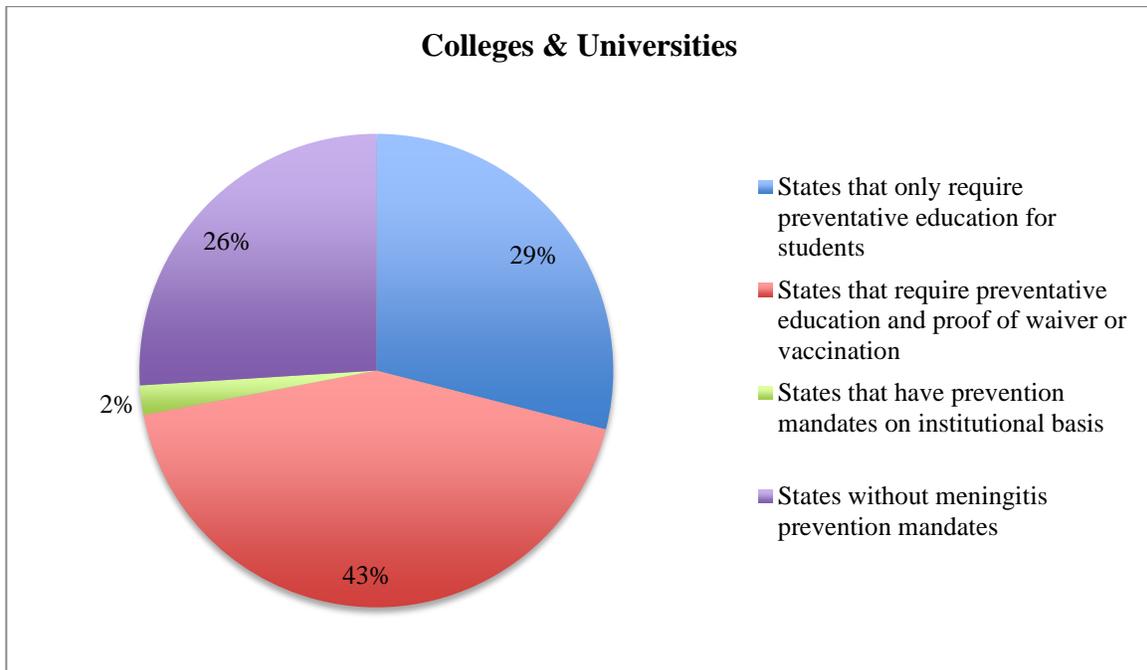


Figure 2. Meningitis prevention mandates for colleges & universities.

Equity of Distribution

State-implemented mandatory dosing schedules take into account exposure risk related to school attendance and participation in sports programs through the collegial level, while simultaneously reducing racial disparities that may exist with vaccine availability (National Foundation for Infectious Diseases, 2010). States with mandatory vaccination schedules have funding in place to reduce out-of-pocket cost to patients. Alaska utilizes the Alaska Vaccine Assessment Program (AVAP) and the Vaccines for Children (VFC) programs, which offer low-cost vaccines to children and some adult patients in the State (Alaska Immunization Program [AIP], 2016).

During 1989 to 1992, there was a nationally declared measles crisis (CDC, 2014). Over half of children infected with measles were not vaccinated despite having seen a health care provider. Because of this outbreak, legislation created the VFC program. The VFC program makes vaccination accessible regardless of ability to pay for children 18 years of age and younger. Each state has a VFC coordinator responsible for keeping record of provider enrollment into the program. Institutions automatically enrolled are public health agencies, federally qualified health centers, and rural health clinics. Any medical establishment can qualify for VFC supplied vaccines, even if the provider does not see Medicaid eligible patients. Patients that are qualified for VFC vaccines must at minimum be 18 years of age or younger. Other criteria that must be met include being Medicaid eligible, underinsured/without insurance, Alaska Native or American Indian, and/or meeting eligibility criteria the Alaska Vaccine Assessment Program. Any child receiving a vaccination meeting at least one of these criteria is supplied with VFC vaccine, which in fact makes all children eligible. Vaccine administration fees vary depending on eligibility criteria, but a state mandated maximum is set for VFC. This federal program covers children receiving the Menactra vaccine who are 18 years of age and younger. The term state-supplied vaccine is interchangeably used with federally supplied vaccine, as the vaccine itself is provided to states by the federal VFC program.

Enrollment in the Alaska Vaccine Assessment Program by healthcare payers (such as private insurance agencies) allows for federally funded vaccine to be distributed to AVAP enrolled healthcare providers. Healthcare payers that have opted out of AVAP program in 2017 include Medicare, Medicaid, Tricare, and Prudential Insurance Company (AVAP, 2017). Healthcare providers opt in to the AVAP program, making vaccination available to adults more affordable. In the State of Alaska, a fee of \$0.60 per adult is charged with a minimum of 50

adults paid for by each facility. Young adults between 19 to 20 years of age, seeing an AVAP opt-in provider with a qualifying healthcare payer or an underinsured status, are eligible to receive federally supplied Menactra vaccine (AVAP, 2017).

Immunization Strategy

It is imperative to take what is known about the ramifications of meningitis as well as the age of the target population most at risk and incorporate this into an inoculation strategy. Incorporating a mandatory meningitis vaccination schedule into the timeframe when other optional vaccines offered to adolescents, such as HPV, would likely be effective.

The effectiveness is enhanced when the timeframe of vaccination is compared to characteristics of the adolescent population. This is because the adolescent can be difficult to reach in terms of illness prevention. According to Humiston and Rosenthal (2005), the healthcare of the adolescent does not revolve around vaccine related appointments. Instead, they are being seen for sports physicals and acute injuries. The opportunity to vaccinate may not be recognized or addressed during a brief illness-focused visit. The literature suggests vaccination alone is not enough to prompt the adolescent into seeing a healthcare provider, unless his/her school requires proof of vaccination (Humiston & Rosenthal, 2005).

Use of Resources

As reported by the CDC, IAC, and the WHO, vaccinating at risk populations is beneficial. Continued surveillance of outcomes following a meningococcal vaccine mandate is essential (WHO, 2016). It is unclear whether efforts to improve current legislation on the topic of mandatory meningitis vaccination in Alaska are underway. Currently, Alaskan universities are only required to educate students on meningitis inoculation benefits. This leaves opportunity for parents and children to decline vaccination, relying on personal feelings for decision making

as opposed to established facts that have led to a national standard of care. In order to overcome existing challenges to implementing a mandatory meningococcal vaccination schedule, an inter-professional approach would be useful. Identifying resources for meningococcal vaccine knowledge including disease burden, vaccine characteristics, surveillance, and immunization strategy to inform the public is an important step in moving towards a vaccine mandate. This strategy could utilize a variety of Alaska-based resources to include Department of Health and Social Services, the Alaska Immunization Program, the Alaska Epidemiology Department, the Alaska Nurse Practitioner Association, public health and school-based resources. National resources to implement such a mandate are also available, such as the CDC and ACIP. It appears this approach would coincide with mandated vaccination programs already in place.

Cost

As previously mentioned, the AVAP and the VFC program already offer affordable vaccines to Alaskans. It is undetermined at this point what the financial implications of implementing a statewide vaccination policy for meningitis would be. Absolute cost of a vaccine program, and the immediate estimation of cost, may be prioritized over the projected value of cost reduction by illness prevention when such programs are being evaluated (Erickson et al., 2005). A projected value-to-cost ratio approximates cost in relation to value of a program over time. Cost benefit analysis is used to determine vaccine policy, but often does not include the quality of life issues that create significant burden for families with a child devastated by bacterial meningitis. These important considerations must be addressed to challenge policy. Understanding themes presented in the literature thus far, one can estimate that by incurring an immediate vaccine cost to reduce rates of future disease, personal and national financial burden will also decrease. Additionally, the Menactra vaccine is already available and promoted by the

Alaska State vaccine program, therefore enhanced costs are not anticipated at the state level. Federal costs may increase as vaccination rates increase, but would be mitigated by the reduction in disease outbreak as demonstrated by the US military meningitis vaccination program.

Effectiveness Evaluation

The World Health Organization (2015) reports that routine meningitis vaccination improves herd protection, which in turn, leads to a reduction in the financial, physical, and emotional challenges placed on individuals, families, and society. Mandatory vaccination policy is recommended for areas with high incidence of the disease. Understanding trends of infection using sophisticated surveillance programs to monitor and record such data, such as those used to monitor the occurrence of other vaccine preventable diseases, is essential to determine the need for vaccine mandates. The Alaska's State Epidemiology program provides such data annually.

As discussed earlier, the US military has reduced the likelihood of outbreak and transmission between personnel living in close quarters after implementing a mandatory meningitis vaccine policy (Broderick, 2015). Since this requirement has begun in the 1970s, meningitis has been successfully reduced by over 90%. One vaccination is required prior to military entry.

Methods

Project Design

Advocacy. The project leader met with Craig Public Health twice over the course of this project to gather program feasibility information. From this interaction, a point of contact from the Alaska Immunization Program was identified. The AIP contact provided information on the VFC and AVAP programs and nonbiased feedback and guidance on project materials.

Senator Cathy Giessel was contacted at the Alaska Nurse Practitioner Association's annual conference. The timeline for this project originally centered on completion of a legislative presentation. It was determined that legislative contact would take place between January and May 2017. However, email correspondence with Senator Cathy Giessel revealed that the Alaska legislative body was focused on Medicaid policy and would not have an opportunity to discuss a mandatory meningitis vaccine schedule this year. While communication with health policy officials did not yield a viable option to present the topic to legislators, it allowed exposure to health policy practices. A policy brief was created to address this barrier. The policy brief was electronically distributed to the legislative health care committee with a brief survey asking one question regarding support of a mandatory meningitis vaccination policy. With the priority of the Health Committee on Medicaid policy, the objective of this project shifted to focus on the other goal of widespread education and increasing public awareness.

Community awareness. The project's focus of increasing awareness of meningitis and the vaccination prevention strategy was initiated for both community members and health care providers. A community education presentation was created for the Prince of Wales (POW) Community Health Fair as a means to disseminate information. The Community Fair occurred on April 8, 2017.

Informational delivery utilized at the Prince of Wales Community Health Fair was primarily done by direct interaction with the public. The project leader secured a meningitis booth. Meningitis awareness stickers, pens, and magnets with meningitis awareness themes were provided as promotional materials. A large two and one half foot by eight-foot meningitis banner was displayed at the booth. A teaching tool was constructed using cupcakes. Fifteen percent of 30 cupcakes were frosted with red icing demonstrating the number of children killed

by meningitis, 19% of the 30 cupcakes were sprinkled with red and pink sprinkles to portray the number of children affected by permanent neurologic and musculoskeletal dysfunction, and the remaining cupcakes were left frosted white to show the remaining healthy children. POW community members stopping at the meningitis booth were offered a brief survey following the educational offering.

Professional Education

The health care education included a “meningitis education bundle” created as a resource for healthcare professionals on Prince of Wales Island. PeaceHealth Medical Group and Craig Public Health received a copy of the bundle. A 25-minute educational presentation for PeaceHealth Medical Group was provided. Craig Public Health will receive the same information within the next three months. Supplemental materials that accompanied the meningitis bundle included 10 vaccination reminder magnets, 20 meningitis awareness stickers, and five meningitis awareness pens.

Data collection

Community education outcomes. The 2017 Community Health Fair data collection was performed using a simple post-test design that consisted of nominal data with yes, no, or maybe answers to a series of questions pertaining to the informational content at the booth and willingness to vaccinate. An optional comments section was provided at the end of the survey for participant feedback (appendix B). Inclusion criteria for participants included (a) age 18 years or older, (b) willingness to complete the survey, (c) participant had at least one educational statement on meningitis and/or vaccination delivered to him/her while at the meningitis booth.

Professional education outcomes. The Alaska Legislative Health Committee member’s survey utilized a simple post-test design that consisted of nominal data, yielding yes, no, or

maybe answers to a single question regarding willingness to support a mandatory vaccination schedule for bacterial meningitis. An optional comments section left at the end of the survey for participant feedback (Appendix A).

Inclusion criteria for participants included (a) being an active member of the Alaska State legislature and (b) a willingness to participate in the survey. Members were selected from the *Legislative Directory* found on akleg.gov.

Barriers and Challenges

The primary barrier to implementing the advocacy portion of this project was getting face-to-face time with the State's legislative members. Contact was made with Senator Giessel January 20, 2017, who made it clear that the agenda for the senate would focus only on Medicaid policy. The health committee was unable to address the topic of meningitis vaccination policy within the timeframe of the graduate project. Because of this setback, the primary goal for this project transitioned to expanding community health using existing standards of care.

The alteration in project design and delivery caused the outcomes measured to change.

Other Considerations

Development of the "meningitis education bundle" occurred in an elective graduate course taken spring semester of 2017. The course revolved around adult learning principles and curriculum development. The topic of meningitis was integrated into course assignments where feedback from the professor and other students helped to promote the development of an excellent education bundle.

Human Subject Status

The University of Alaska Anchorage Institutional Review Board approved the project prior to project implementation. Survey data was collected using anonymous human subjects. Data was only collected from voluntary participants who met the inclusion criteria discussed previously. There were no patient identifiers collected or documented.

Project Outcomes

The primary objective for data analysis was to discern the degree of support from a small group of state policy leaders for a mandatory meningitis vaccination schedule. These data were collected to support future legislative advocacy and community awareness initiatives on this topic. The secondary objective was to increase community awareness of meningitis and its prevention. Questions were posed to discern whether educational intervention was beneficial in raising vaccine rates and gaining support for a required meningitis vaccine policy.

Data Analysis

Data collection was performed using a simple post-test design and nominal quantification. One of nine members of the Alaska Legislative Health Committee responded indicating an answer of maybe. The remaining eight members did not respond to the survey. The survey remained open for 12 days. Table 1 shows the distribution of responses.

Table 1.

Survey Responses from Legislative Health Committee: Would you support a mandatory meningitis vaccination schedule?

Members	Yes	No	Maybe	Did not respond
Subject 1			1	
Subject 2				1
Subject 3				1
Subject 4				1
Subject 5				1
Subject 6				1
Subject 7				1
Subject 8				1
Subject 9				1
Sum	9		1	8

Participants in the POW health fair survey met the inclusion criteria previously outlined. The meningitis awareness information was available to the public for six hours during the fair. Eighty-two participants stopped at the booth, 68 participants received meningitis educational statements, and 65 participants received educational statements and completed a POW health fair survey. A non-biased data collector documented the number of people who stopped at the booth, how many received educational statements, and provided assurance that inclusion criteria were met for the survey. All participants in the survey met the inclusion criteria (18 years of age or older and having had at least one educational statement). Questions included in the survey were:

1. Would you choose to vaccinate against meningitis?
2. If yes, did the education you received today influence your decision to vaccinate?
3. If no, why would you choose not to vaccinate?
4. Would you support a required meningitis vaccine for children attending public school in Alaska?

The answer to question number three was a write-in response. A comments section at the end of the survey was included. In order to reduce researcher influence on survey answers, the participants were provided privacy to complete the survey.

Fifty-six participants indicated that they would choose to vaccinate against meningitis, five responded with a *no*, and four indicated a response of *maybe*. Fifty-two respondents indicated that they felt the educational offering influenced their decision to vaccinate, five did not feel the education influenced their decision, and nine indicated a response of *maybe*. Individuals indicated that they did not want to vaccinate against meningitis due to side effects of the vaccine, a previously vaccinated status (for either themselves or their children), or an anti-vaccine cultural influence. Fifty-three participants were in favor of a required meningitis vaccine for children attending public school, five were not, and eight indicated a response of *maybe*. For respondents who were either not in favor of vaccination or in favor of a required vaccination for children attending public school, additional comments were directed towards the safety, efficacy, and financial aspects of a required vaccine program. Additionally, maintaining personal autonomy in vaccination policy was also a concern. Figures 3, 4 and 5 reflect survey response percentages.

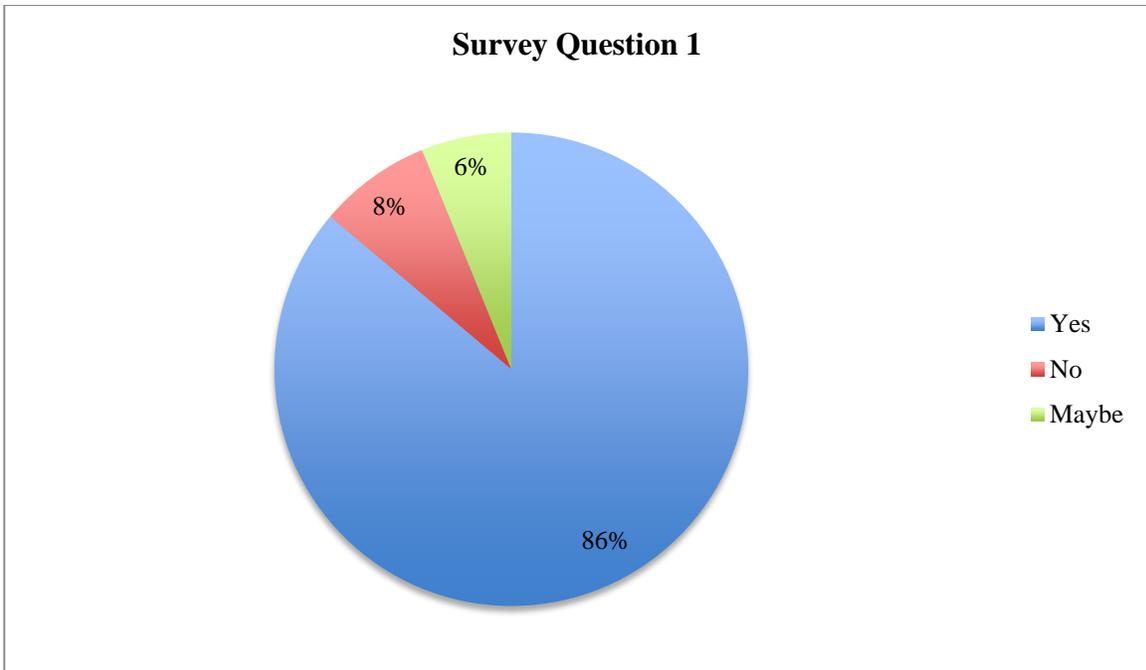


Figure 3. Question 1: Would you choose to vaccinate against meningitis?

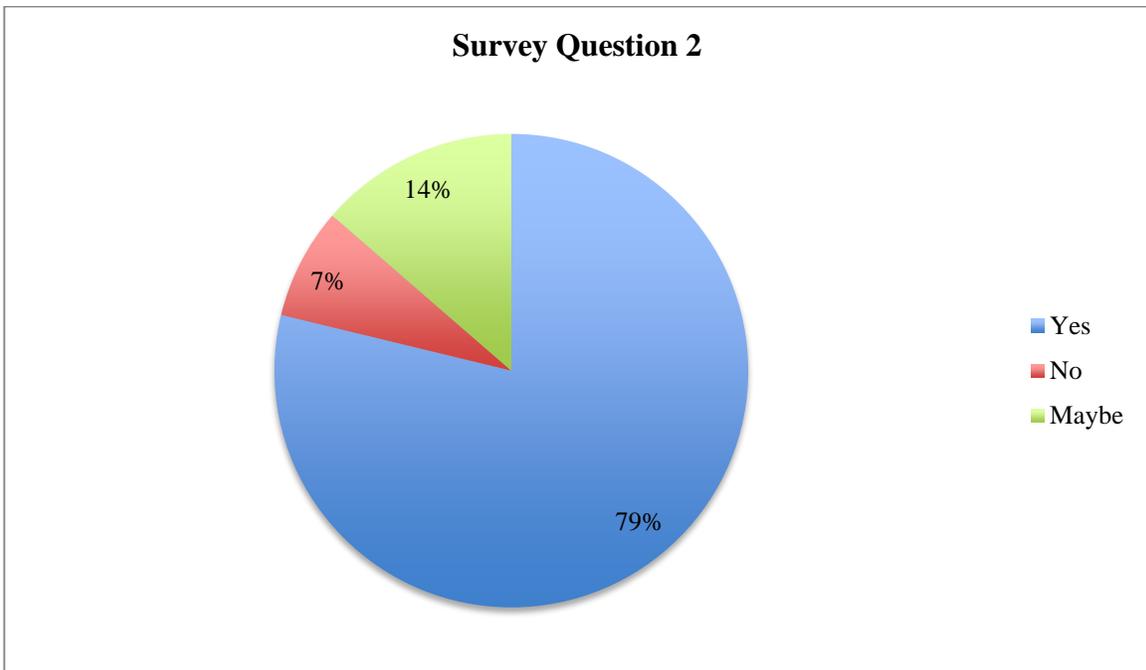


Figure 4. Question 2: If yes, did the education that you received influence your decision to vaccinate?

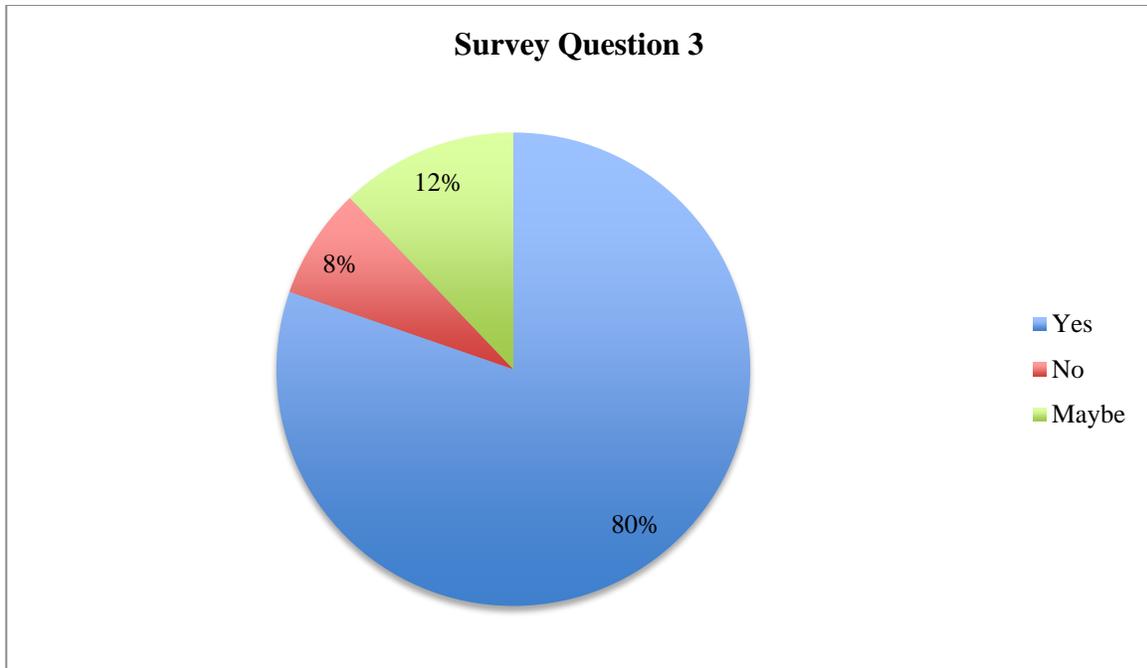


Figure 5. Question 3: Would you support a required meningitis vaccine for children attending public school in Alaska?

A total of 10 bumper stickers, 38 vaccination reminder magnets, 74 meningitis awareness stickers, and 18 meningitis awareness pens were provided to the public. Additionally, there were several occasions in which education was provided to adolescents and young adults regarding meningitis vaccination, however, they did not meet inclusion criteria for the survey. The cupcake display showing the percentage of those affected with meningitis death rates and permanent disabilities was successful based upon feedback gained from those who received education at the booth. The cupcake-teaching tool helped draw children and parents to the meningitis booth. Appendices C through G provide POW health fair material.

Data Synthesis

The Alaska Legislative Health Committee survey provided a single response of maybe. Although a comprehensive health policy brief was provided, committee members did not participate in the survey. It is unclear if the legislature would support incorporation of a required

meningitis vaccination into existing Alaska vaccine policy. There are many unknown variables as to why participation was low, but likely related to the sole focus on Medicaid reform.

The POW annual health fair survey data concluded that community awareness efforts were successful. Education to the public was effective; the majority of participants who were surveyed supported a required vaccine schedule for children attending public school. Many favorable comments were made that indicated support for future vaccine awareness initiatives. It is likely that efforts similar to this would be successful in other locations of Alaska.

Dissemination

The project was developed and implemented over a nine-month period concluding April 2017. The project leader has a passion to move mandatory meningitis vaccination into law. Efforts to advocate for a mandatory meningitis vaccination schedule will continue until Alaska incorporates mandatory meningitis vaccination into existing vaccine policy.

Collaboration with Marianne Murray with the University Alaska Anchorage School of Nursing offered an opportunity to disseminate meningitis awareness information to Theta Omicron Chapter of Sigma Theta Tau International. A date for this has yet to be solidified.

Change in Practice

Evidence found in the literature supports a nationally established standard of care pertaining to meningitis vaccination. Quadrivalent vaccination demonstrates safety and efficacy in preventing illness by meningitis serotypes most responsible for causing catastrophic illness. The Advisory Committee on Immunization Practices and the Centers for Disease Control and Prevention has established a recommended vaccination schedule. To enhance accessibility, the federal VFC program includes the meningococcal vaccine and is available to children 18 years and younger (along with other required vaccinations). As depicted previously, 27 of 51 US

states have a mandatory meningitis vaccination mandate in place to some degree (IAC, 2017). Out of 51 states, 38 have a meningitis prevention strategy for colleges and universities, which either does or does not include proof of vaccination or waiver. Combined, a total of 44 states have some form of meningitis prevention policy in place. Alaska has yet to incorporate a meningitis vaccination mandate into existing vaccination policy. Alaska requires that students be educated on meningitis prevention when entering onto a college campus, but vaccination is optional. Moving towards national uniformity in meningitis prevention practices and global health, Alaska should incorporate a mandatory meningitis vaccination schedule into existing vaccination policy. This would alter existing practice to a small degree, as there are already seven required vaccinations in Alaska for children to attend public school.

Recommendations for Future Study

There is a preponderance of literature with strong evidence-based support for the recommendations made in favor of a meningitis vaccination mandate. It would be reasonable to evaluate mandates in other states that have already put mandatory meningitis vaccination in place to determine the feasibility and long-term implications this type of program might create. Monitoring epidemiologic data pre and post vaccine mandate to evaluate policy change effects in meningitis occurrence would be beneficial. Evaluating these data could provide further evidence that required vaccination improves disease rates, as this was suggested by the literature.

Additionally, literature on the topic should be updated annually to ensure accuracy of information.

Community educational endeavors should extend beyond Prince of Wales Island. Options to expand this initiative in Alaska include creating a public service announcement,

building a meningitis prevention website or Facebook page, and holding direct public educational events in other areas.

Conclusion

Professional Standards

Meeting qualifying criteria as outlined by the Master's Essentials within the American Association of Colleges of Nursing was foundational for the structure of this project. This project contains a scientific basis for illness prevention and aims to promote health and wellness, as dictated by national standards of care. The primary goal for this project was to incorporate a mandatory meningitis vaccination schedule in already existing Alaska vaccine policy. The process in which to achieve this goal involved professional leadership within the discipline, advocacy on a state level, and an understanding for how policies influence healthcare decision-making. This served as the advocacy and leadership component of the project.

The secondary goal for this project was to increase general awareness of meningitis and its prevention within Alaska. Achieving this goal required professional collaboration on various levels, designing creative strategies for informational dissemination, and addressing social determinants of health. This served as the community health portion of the project focusing on population health outcomes.

Goals for graduate student education met through the design, implementation, and analysis of the project outcomes for this project successfully met the Master's Essentials of Nursing Practice. This project included analyzing existing evidence, drawing conclusions from such evidence, and applying the evidence to practice incorporating inter-professional collaboration, systems leadership, and clinical prevention and population health for improving the state's health.

Summary

In conclusion, the project was not successful in moving mandatory meningitis vaccination into policy. However, the project was successful in evaluating community likelihood to vaccinate and supporting a required vaccination schedule for public school attendance and demonstrating that community education may provide a basis for policy change. Further steps should be taken to advocate for implementing a meningitis vaccination policy in Alaska. There should also be ongoing efforts to increase meningitis awareness within various Alaskan communities.

References

- Advisory Committee on Immunization Practices. (2005). *Meningococcal vaccines: Menomune and menactra frequently asked questions august 2005*. Retrieved from <http://library.state.or.us/repository/2010/201008241450092/index.pdf>
- Alaska Immunization Program. (2016). *State of Alaska school/child care/head start and preschool immunization requirements*. Retrieved from <http://epi.alaska.gov/immunize>
- Alaska State Legislature. (2015). *Alaska Statutes: Sec. 14.48.165 immunization of postsecondary students*. Retrieved from <http://www.legis.state.ak.us/basis/statutes.asp#14.48.165>
- Alaska Vaccine Assessment Program. (2017). *For providers: Participating and non-participating payers*. Retrieved from <http://www.akvaccine.org/akvaccine.nsf/pages/for-providers.html>
- American Academy of Pediatrics. (2016). *Vaccine preventable diseases and policy*. Retrieved from <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/immunization/Pages/vaccine-preventable-diseases-and-policy.aspx>
- American Association of Colleges of Nursing. (2011). *The essentials of master's education for advanced practice nursing*. Retrieved from <http://www.aacn.nche.edu/education-resources/MasEssentials96.pdf>
- American Association of Nurse Practitioners. (2012). *Professional development*. Retrieved from <https://www.aanp.org/practice/professional-development>
- Broderick, M.P., Phillips, C., Faix, D. (2015). *Meningococcal disease in US military personnel before and after adoption of conjugate vaccine*. Retrieved from www.cdc.gov/eid
doi: <http://dx.doi.org/10.3201/eid2102.141037>
- Centers for Disease Control and Prevention. (1999). MMWR: Framework for program evaluation in public health. *Morbidity and Mortality Weekly Report*, 48(11); 1-40
- Centers for Disease Control and Prevention. (2016). *CDC's strategic framework for global immunization, 2016-2020*. Retrieved from www.cdc.gov/globalhealth/immunization
- Centers for Disease Control and Prevention. (2014). *Meningococcal disease: Causes and transmission*. Retrieved from <http://www.cdc.gov/meningococcal/about/causes-transmission.html>

Centers for Disease Control and Prevention. (2017). *Meningococcal disease: Technical and clinical information*. Retrieved from <https://www.cdc.gov/meningococcal/clinical-info.html>

Centers for Disease Control and Prevention. (2016). *Bacterial meningitis*. Retrieved from <http://www.cdc.gov/meningitis/bacterial/html>

Centers for Disease Control and Prevention. (2014). *VFC Healthcare Providers Information Flyer*. Retrieved from <https://www.cdc.gov/vaccines/programs/vfc/providers/questions/qa-flyer-hcp.html>

Centers for Disease Control and Prevention. (2015). *Meningococcal disease*. Retrieved from <http://www.cdc.gov/meningococcal/surveillance/index.html>

Creswell, J.W. (2013). *Qualitative inquiry & research design: Choosing among five approaches*. Thousand Oaks, CA: Sage Publications.

Department of Health and Social Services. (2015). *State of Alaska Epidemiology bulletin*. Retrieved from <http://epibulletins.dhss.alaska.gov/Document/Display?DocumentId=15>

Elam-Evans, L.D., Yankey, D., Jeyarajah, J., Singleton, J.A., Curtis, R.C., MacNeil, J., & Hariri, S. (2014). *National, regional, state, and selected local area vaccination coverage among adolescents aged 13-17 years—United States, 2013*. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6329a4.htm>

Erickson, L.J., Wals, P.D., & Farand L. (2005). An analytical framework for immunization programs in Canada. *Vaccine* (23), 2470-2476

Gonzalez-Lorenzo, M., Piatti, A., Coppola, L., Gramegna, M., Demicheli, V., Melegaro, A., Tirani, M., Parmelli, E., Auxilia, F., & Moja, L. (2014). Conceptual frameworks and key dimensions to support coverage decisions for vaccines. *Vaccine*, 33; 1206-1217

Grove, S.K., Burns, N., Gray, J.R. (2013). *The practice of nursing research: Appraisal, synthesis, and generation of evidence*. St. Louis, MI: Elsevier & Saunders.

Humiston, S.G., Rosenthal, S.L. (2005). Challenges to vaccinating young adults. *The Pediatric Infectious Disease Journal*, 24(6); 134-140.
doi: 10.1097/01.inf.0000166161.12087.94

Immunization Action Coalition (2017). *State information: Meningococcal ACWY Prevention Mandates for Colleges and Universities*. Retrieved from <http://www.immunize.org/laws/menin.asp>

Immunization Action Coalition (2017). *State information: Meningococcal state mandates for elementary and secondary schools*. Retrieved from

http://www.immunize.org/laws/menin_sec.asp

Immunization Action Coalition. (2016). Ask the experts: Diseases and vaccines. Retrieved from http://www.immunize.org/askexperts/experts_men.asp

National Foundation for Infectious Diseases. (2010). *Meningococcal vaccination, improving rates in adolescents and reducing racial, ethnic, and socioeconomic disparities* [data file]. Retrieved from <http://www.adolescentvaccination.org/resources/meningococcal-cta.pdf>

National Meningitis Association. (2016). *Disease and prevention information*. Retrieved from <http://www.nmaus.org/disease-prevention-information/>

National Meningitis Association. (2016). *Statistics and disease facts*. Retrieved from <http://www.nmaus.org/disease-prevention-information/statistics-and-disease-facts/>

National Meningitis Association. (2016). *How can it be prevented?* Retrieved from <http://www.nmaus.org/disease-prevention-information/how-can-it-be-prevented/>

Omer, S.B., Salmon, D.A., Walter, O.A., deHart, P.M., Halsey, N. (2009). Vaccine refusal, mandatory immunization, and the risks of vaccine preventable diseases. *The New England Journal of Medicine*, 360; 1981-1988
doi: 10.1056/NEJMsa0806477

Paul, D. (2011). Biomed Refresher 2: Informed consent [data file]. Retrieved from <https://www.citiprogram.org/members/index.cfm?pageID=665&ce=1>

Sanofi Pasteur Inc. (2014). *Full prescribing information: Menaetra* [data file]. Retrieved from <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM131170.pdf>

Sanofi Pasteur Inc. (2016). *Full prescribing information: Menomune* [data file]. Retrieved from <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM308370.pdf>

US Department of Health and Human Services. (2017). Community immunity (“herd immunity”). Retrieved from <https://www.vaccines.gov/basics/protection/>

Woo, T.M. & Robinson, M.V. (2016). *Pharmacotherapeutics: For advanced practice nurse prescribers* (4th ed). Philadelphia, PA: F.A. Davis Company

World Health Organization. (2015). *Meningococcal meningitis*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs141/en/>

World Health Organization. (2016). *Immunization vaccines, and biologicals*. Retrieved from http://www.who.int/immunization/monitoring_surveillance/en/

Appendix A

Survey to Legislative Health Committee

Amanda Hulstine <aeadsall@alaska.edu>
to Representative. ▾ 1:46 PM (6 hours ago) ☆ ↶ ▾

To Whom it May Concern,

My name is Amanda Hulstine. I am a nurse practitioner student at the University of Alaska Anchorage. I am completing my master's project on the incorporation of a meningitis vaccination schedule into Alaska's already existing vaccine policy. Vaccine policy similar to this is already in place in Alaska however meningitis is not included as of yet. I have spent nearly a year researching this topic and am very passionate regarding its outcome.

Below is a summary of bacterial meningitis and its vaccination. Please take a moment to review this before completing an anonymous one question survey.

These answers will be used completely anonymously in order to demonstrate estimated support of such a policy. Violation in keeping answers anonymous would put me in direct violation of UAA's research approval process and would be considered unethical and unacceptable.

Please also review attached policy briefing. This is where the bulk of the project information is contained and serves as rationale for my vaccination agenda. Reference information used for slide below are also attached.

Thank you so much for your participation.



Link to anonymous one question survey:

SurveyMonkey Preview & Test

UAA Meningitis Vaccination Schedule Survey

The response to this survey will be kept completely anonymous.

1. Would you support a required meningitis vaccination policy in Alaska?

Yes

No

Maybe

Other (please specify)

Desktop Tablet Phone

Appendix B

Survey to Community at 2017 POW Community Health Fair

2017 POW Annual Health Fair

Amanda Hulstine BSN, RN, FNPS

University Alaska Anchorage, Masters of Nursing Science

Meningitis Awareness Health Fair Survey

1. Would you choose to vaccinate against meningitis?
 - Yes
 - No
 - Maybe

2. If YES, did the education that you received influence your decision to vaccinate?
 - Yes
 - No
 - Maybe

3. If NO, why would you choose NOT to vaccinate?

4. Would you support a required meningitis vaccine for children attending public school in Alaska?
 - Yes
 - No
 - Maybe

Comments:

Appendix C

2017 POW Community Health Fair Meningitis Sticker

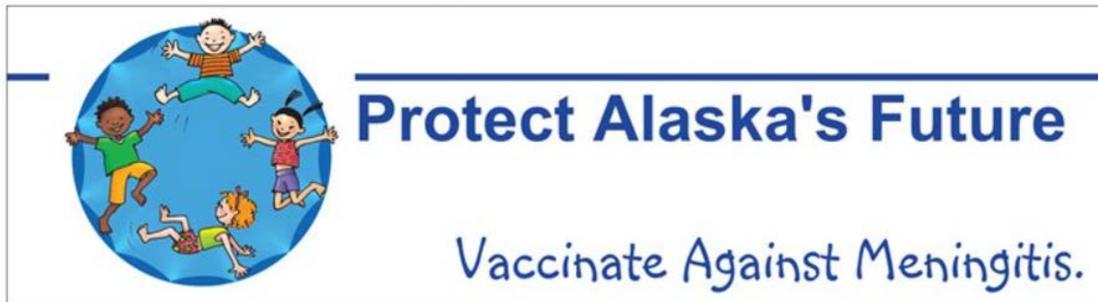
Large Stickers - Circle



Appendix D

2017 POW Community Health Fair Bumper Sticker

Bumper Stickers - Rectangle



Appendix E

2017 POW Community Health Fair Meningitis Reminder Magnets



Appendix F

2017 POW Community Health Fair Meningitis Pens



Appendix G

2017 POW Community Health Fair Meningitis Banner

2.5' x 8' Vertical Banners

**Protect
Alaska's
Future**

**Vaccinate Against
Meningitis.**

Bacterial meningitis often strikes healthy people and causes permanent effects or death.

Adolescents and young adults are most at risk.

The meningitis vaccine protects against bacterial meningitis strains most likely to cause illness.

Vaccination to youth is free in Alaska.

Vaccination is safe and causes very few side effects.

Don't wait- vaccinate!

Ask your healthcare professional for more information.

The first dose is recommended at age 11-12.

A booster dose should be given at age 16.