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Fall 2018 Second Prize Essay

IMPROVING CAMPUS AND COMMUNITY HEALTH

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University students are at a considerably higher risk for contracting virulent viruses and contagious diseases due to students' negative perceptions about vaccines and the high-density living environments on campuses, resulting in suboptimal vaccination rates. Universities can play a vital role in encouraging the student population to get vaccinated. By helping to further educate the student body, universities can help students to achieve health literacy, enabling students to make better decisions regarding their health. Research shows that vaccine-preventable diseases can have devastating impacts for college students, including lower academic performance, decreased attendance, and death (Potter); therefore, it is imperative that universities include mandated vaccinations as a part of admission requirements for all incoming freshman.

Vaccines play a vital role in helping to protect against dangerous diseases. When a person is vaccinated, their body develops immunity to a disease ("Understanding How Vaccines Work"). Vaccines imitate an infection and cause the body to produce T-lymphocytes, defensive white blood cells ("Understanding How Vaccines Work"). The imitation infection can sometimes cause minor symptoms, but these are normal and expected ("Understanding How Vaccines Work"). After the imitation infection goes away, "the body is left with a supply of 'memory' T-lymphocytes, as well as B-lymphocytes that will remember how to fight that disease in the future" ("Understanding How Vaccines Work"). Many people may report that they contracted the disease after receiving the vaccination, but this is a misconception. It is possible for someone who has been vaccinated to contract the disease afterwards, however, this is because it takes time for the body to produce these defensive white blood cells, so during this period, a person could be infected with the disease because "the vaccine has not had enough time to provide protection" ("Understanding How Vaccines Work").

At Duquesne University, the Student Code of Conduct requires students to have the MMR (measles, mumps, and rubella) and meningitis (meningococcal quadrivalent) vaccines ("Required Vaccinations & Health Forms"). However, health professions students from the School of Pharmacy, School of Nursing, and Rangos School of Health Science are subject to additional vaccination requirements to meet pre-clinical requirements ("Required Vaccinations & Health Forms"). These requirements are more comprehensive to ensure that students are in compliance with state legislation and healthcare facility requirements when placed in clinicals. Additional vaccinations include Tdap (tetanus, diphtheria-acellular, and pertussis) vaccine within the past ten years, hepatitis B vaccination series, varicella/chickenpox vaccine, and influenza vaccine ("Required Vaccinations & Health Forms"). Duquesne University adheres to the immunization guidelines outlined by the American College Health Association, which was "developed from the Advisory Committee on Immunization Practices (ACIP) recommendations published by the U.S. Centers for Disease Control and Prevention (CDC)" ("Required Vaccinations & Health Forms").

However, some universities require all students, including non-health professions students, to receive a more comprehensive list of vaccines before enrolling (New). And while Duquesne University adheres to the guidelines set forth by the American College Health Association, the American College Health Association still advises college students to receive more vaccinations against preventable disease that are not

mentioned in Duquesne University's Student Code of Conduct. While it is commendable that Duquesne University is attempting to prevent outbreaks, the campus would be much safer if Duquesne University had a more comprehensive prematriculation policy regarding mandated vaccinations to prevent against all diseases, given that the United States is experiencing a reemergence of many vaccine-preventable diseases ("Required Vaccinations & Health Forms").

The antivaccination movement has gained traction over recent years, which has created much unneeded controversy over vaccinations. One common misconception that has arisen from the increased popularity of the anti-vaccination movement is that vaccinations can cause autism. This idea was first introduced in the 1990s by a group of British researchers ("Do Vaccines Cause Autism?"). In their cohort study published in *Lancet*, their research suggested that there was a correlation between the MMR vaccine and the likeliness of having bowel disease ("Do Vaccines Cause Autism?"). The link between the MMR vaccine and bowel disease was then further explored by gastroenterologist, Andrew Wakefield, MD, who speculated that, "persistent infection with vaccine virus caused disruption of the intestinal tissue that in turn led to bowel disease and neuropsychiatric disease (specifically, autism)" ("Do Vaccines Cause Autism?"). Later, Wakefield, along with 12 co-authors, published a case series study in *Lancet* providing evidence that supported Wakefield's speculation of children being more likely to exhibit autism symptoms after receiving the MMR vaccination ("Do Vaccines Cause Autism?"). The publication received astounding media attention and following the news of this, the MMR vaccination rates in both Britain and the United States plummeted ("Do Vaccines Cause Autism?"). However, over the next twelve years, many researchers would attempt to further study the correlation between autism and the MMR vaccine to no avail; none of the newer studies would be able to find evidence supporting Wakefield's claims. Wakefield's study would later be retracted as it was discovered that Wakefield was "paid by attorneys seeking to file lawsuits against vaccine manufacturers" and that he also "committed research fraud by falsifying data about the children's conditions" ("Do Vaccines Cause Autism?"). However, it is clear that despite the retraction of the study, the effects of it on public perception are remaining.

While the general public is becoming increasingly skeptical about the effectiveness and potential side effects of vaccinations, within the medical community, there is no doubt about the importance of vaccinations for community health. Vaccinations play a vital role in preventing major epidemics. Not only does getting vaccinated protect the individual, it also helps protect the community they live in because "when enough of the community is immunized against a contagious disease, most other members are protected from infection because there's little opportunity for the disease to spread" ("Community Immunity"). This concept is called "herd immunity" ("Community Immunity"). However, for a population to obtain "herd immunity", the immunization rate needs to be approximately 95 percent, however, "vaccination rates on college campuses are 'strikingly low' — as low as 8 percent and only as high as 39 percent, according to a 2016 report from the National Foundation of Infectious Diseases" (James; New).

Herd immunity is especially important in ensuring the safety of those who are unable to get vaccinated. People afflicted by weakened immune systems, such as "people who have cancer, HIV/AIDS, type 1 diabetes, or other health conditions and for the very small group of people who don't have a strong immune response from vaccines" ("Vaccines Protect Your Community"). Other groups of people who are unable to get vaccinated include newborns and pregnant women ("Community Immunity"). Herd immunity greatly benefits these people. If enough people get vaccinated, it is possible for infectious diseases to be completely eradicated. One example of contagious disease eradication due to vaccines is the *Hae-mophilus influenza* type b disease, which affected 1 out of every 200 children younger than age 5 and often left survivors with permanent brain damage and killed many others. After the introduction of the infant vaccination in the mid-19080s against the disease, the incidence of the disease dropped by 99% ("Com-

munity Immunity”). Another instance of herd immunity at work is the pneumococcal vaccines. The pneumococcal disease can “cause serious infections of the ears, lungs, blood, and brain” and while children are more likely to contract the disease, adults are more at risk for the serious pneumococcal infections (“Vaccines Protect Your Community”). When a pediatric pneumococcal vaccine was approved, the number of adults hospitalized for the disease drastically decrease, despite there being no vaccine approved for adults yet. This demonstrates causation; when more children received immunity from the disease, the adults in their community were protected. Universities should consider the implications of having such a low vaccination rate among their students and the risks it poses for faculty, staff, students, and nearby populations that cannot be vaccinated and will become more vulnerable due to the low immunization rate.

Transitioning from high school to college is hard for many students. This transition is often a time where students experience loneliness and make radical changes in their health behaviors, such as sleeping behaviors, alcohol consumption, exercise habits, smoking, etc. (Pressman, et al. 297) For many college freshmen, moving to college is the first time they are living away from home and along with that, it is the first time they are forced to make lifelong health decisions for themselves without assistance. This presents an issue that many universities struggle to tackle. Preventing the spread of infectious diseases poses a serious challenge for universities across the country. However, the most efficient way for universities to address this issue is by implementing policy changes that would require all incoming students to be vaccinated. Prevention has been proven far more effective and efficient, rather than treating an epidemic waiting to happen. It is far easier to take preventative measures against diseases, rather than attempt to treat a campus-wide outbreak. An outbreak that affects the majority of a student population would be sure to devastate and overwhelm campus resources; health promotion and disease prevention are far more practical in comparison.

Currently, there are 22 states that do not require students to be vaccinated (New). This is both alarming and frightening. College students are at a much greater risk of contracting vaccine-preventable illnesses and, once an outbreak occurs, it is hard to prevent the rapid spread of the disease, especially if the majority of students are not vaccinated. University students should be advised to take as many precautions as possible in preventing contagious diseases because illness represents a significant burden on students because it is capable of “affecting their health as well as academic and work performance” (Ratnapradipa, et al. 662). Princeton University’s serogroup B invasive meningococcal disease outbreak perfectly demonstrates the devastating effects of a disease outbreak on college campuses (“College Campus Outbreaks”). In 2014, “CDC officials reported the attack rate of disease on the Princeton campus to be 134 cases per 100,000 students — 1,400 times greater than the national average” (“College Campus Outbreaks”). Over 3 million people die every year from vaccine-preventable diseases and in the Princeton University outbreak, one student’s life was needlessly claimed (“Global Immunization”; “College Campus Outbreaks”). Since Princeton’s outbreak occurred, three other colleges have experienced serogroup B meningococcal disease outbreaks: “the University of California Santa Barbara (UCSB), where five cases also occurred that year; and this year at Providence College in Rhode Island, where five cases were reported; and at the University of Oregon, where seven cases occurred” (“College Campus Outbreaks”). These universities experienced similarly frightening greater risks of attack rate on their campuses; “the attack rates... were 22.1 per 100,000 students at UCSB and 44 per 100,000 students at Providence; that was 234 times and 500 times, respectively, greater than the incidence rate for persons aged 17 to 22 years in the general U.S. population” (“College Campus Outbreaks”).

Lisette LeCorgne, a nurse practitioner at the University of Arizona Campus Health Services, equates college students living in dorms like “living in a petri dish” (“9 Health Hazards Hidden in College Dorms”). Despite this, vaccination rates are strikingly low on college campuses, with statistics ranging

from “as low as 8 percent and only as high as 39 percent, according to a 2016 report from the National Foundation of Infectious Diseases” (James). Once infected, it can devastate all aspects of their life: social, academic, spiritual, and physical. Colds and flu-like illnesses that are common in college students have been found to “negatively affect class work and work attendance and school performance” (Potter). Vaccination is associated with “significant reductions in... provider visits, antibiotic use, impaired school performance, and numbers of days of missed class, missed work, and illness during the influenza seasons” (Nichol et al. 1113). In both the interest of student health and productivity, Duquesne University should consider implementing more comprehensive vaccines in the Student Code of Conduct requirements for admission.

As mentioned previously, minor symptoms are normal and expected after being vaccinated. Though some people may experience a more mild or severe adverse reaction to vaccines, they are rare and “occur in less than one in every 100,000 doses administered” (Potter). This statistic further emphasizes the importance of herd immunity. While allergic reactions and poor antibody response to vaccines are rare and can prevent people from being vaccinated, these few people can still be protected and immune from disease if the majority of people in their community are vaccinated.

Research has shown that “vaccinations and non-pharmaceutical interventions (NPIs) were key strategies for mitigating the spread of influenza,” however, surveys show that universities’ educational campaigns did not lead to behavioral changes among the student population (Hashmi et al. 739-740). Given the extremely low campus vaccination rates mentioned previously, it is imperative for colleges to effectively implement preventative strategies and policies that will result in behavioral changes by examining the factors that influence students’ decision to receive the vaccines. Considering that colleges struggle to craft effective messages to encourage students to get vaccinated, implementing policy changes may be the needed action to protect the university campus and surrounding community.

Universities can play a large role in contributing to herd immunity and preventing the reemergence of vaccine-preventable diseases. It is well researched that vaccines are effective and carry minimal risks. While adverse reactions can happen, they rarely occur. Vaccine-preventable diseases claim the lives of millions around the world every year, and “approximately 1.5 million of these deaths are in children less than 5 years old.”?: In the interest of students’ physical and mental wellbeing, academic success, and social health, universities should consider implementing more comprehensive vaccination mandates in their policies.

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