

Hello all,

Happy January! I hope this email finds you well and you had a wonderful holiday season. This month's update from the field topic is the influenza vaccine. It's a timely reminder that even though COVID-19 is at the forefront of our brains, seasonal influenza still exists and getting vaccinated is even more important this year. I've collected a few articles on the topic and also encourage you to check out these guidelines from the CDC here:

<https://www.cdc.gov/flu/prevent/keyfacts.htm>

As always, if you have any questions or would like to see the full articles, please email me.

Best,

Stephanie McMillan
stephanie-mcmillan@uiowa.edu

Universal Vaccines and Vaccine Platforms to Protect against Influenza Viruses in Humans and Agriculture

Rajão, Daniela S., and Daniel R. Pérez. "Universal vaccines and vaccine platforms to protect against influenza viruses in humans and agriculture." *Frontiers in microbiology* 9 (2018): 123.

Influenza virus infections pose a significant threat to public health due to annual seasonal epidemics and occasional pandemics. Influenza is also associated with significant economic losses in animal production. The most effective way to prevent influenza infections is through vaccination. Current vaccine programs rely heavily on the vaccine's ability to stimulate neutralizing antibody responses to the hemagglutinin (HA) protein. One of the biggest challenges to an effective vaccination program lies on the fact that influenza viruses are ever-changing, leading to antigenic drift that results in escape from earlier immune responses. Efforts toward overcoming these challenges aim at improving the strength and/or breadth of the immune response. Novel vaccine technologies, the so-called universal vaccines, focus on stimulating better cross-protection against many or all influenza strains. However, vaccine platforms or manufacturing technologies being tested to improve vaccine efficacy are heterogeneous between different species and/or either tailored for epidemic or pandemic influenza. Here, we discuss current vaccines to protect humans and animals against influenza, highlighting challenges faced to effective and uniform novel vaccination strategies and approaches.

Hit Me with your Best Shot: A Critical Analysis of the Resistance to Vaccine Utilization

Sistrunk, Katherine Coleman. "Hit Me with your Best Shot: A Critical Analysis of the Resistance to Vaccine Utilization." (2019).

Vaccines have provided humans protection from infectious diseases for centuries, yet the vaccination rate in the United States fails to come near one-hundred percent, allowing vaccine-preventable diseases to re-emerge in communities across the nation. Vaccines have proven to be a safe and effective method in preventing the spread of infectious disease, but vaccine resistance remains high due to false information perpetuated by anti-vaxxers, greatly impacting the vaccination rate in our country. This thesis, by means of a literature review, provides a critical analysis the resistance to vaccine utilization in the United States to determine what policy recommendations and interventions can be made to reduce the resistance to vaccines and increase the vaccination rate in our country. Vaccine hesitancy has been around ever since the creation of the first vaccine and as the years went on, the modern anti-vaxx movement gained ground, voicing concerns over the ingredients in vaccines, the number of vaccines children receive in their first year, and the belief of the myth that vaccines cause autism. Even after medical science and years of research have validated the safety of vaccines and have shown no link to autism, vaccine hesitancy is still an issue as anti-vaxxers push to receive exemptions for medical, religious or philosophical reasons. Several states offer these types of exemptions, furthering the low vaccination rates in the United States and putting citizens' health and safety at risk. The findings of the critical analysis were comparable to the literature review: compulsory vaccine laws have proven to be a successful solution to increase vaccination rates; however, these laws are left up to the states, allowing many individuals to go unvaccinated as only Mississippi, West Virginia, and California do not allow religious and philosophical exemptions. In order to address the low vaccination rates in the United States, policy interventions must be made through the states, the federal government, health care providers, and community and government-based organizations to increase the vaccination rate in our country through measures intended to increase vaccine compliance. Without these policy interventions, our nation and our world will never be free from the threat of vaccine-preventable infectious diseases.

In-school Influenza Vaccinations: A Quality Improvement Project to Improve Influenza Vaccination Availability in School-Aged Children in a Rural Community Review of Literature

Peterson, Jodi. "In-school Influenza Vaccinations: A Quality Improvement Project to Improve Influenza Vaccination Availability in School-Aged Children in a Rural Community Review of Literature." (2020).

Influenza is an illness that affects persons across the life span. Hundreds of thousands of people contract influenza each year in the United States, which can lead to hospitalization and even death. The influenza vaccine reduces transmission of the virus and prevents complications. In-school influenza vaccine clinics can increase rates of vaccination in school-aged children and as a result, help prevent infections in families. Many barriers to influenza vaccination exist, including cost of vaccine administration, missed time at work or school to obtain the vaccine, and misperceptions about the vaccine and its effectiveness. In-school influenza vaccines were provided to school-aged children in a rural Midwest county for the 2019-2020 influenza season by a group of nurse volunteers working in conjunction with county emergency management volunteers. Once vaccines were administered, the perceptions regarding vaccination availability as well as vaccine effectiveness by consenting parents/guardians to school-aged children were compared to data from 2018-2019 using an online survey. Parents/guardians did not report a perceived increase in convenience to access of the vaccine despite an increased use of vaccine clinics over physician's offices for receipt of vaccine as well as a modest increase in vaccines received. Plans for future vaccine clinics are underway.

It wasn't supposed to be a coronavirus: The quest for an influenza A(H5N1)-derived vaccine and the limits of pandemic preparedness

Dolan, Brian. "It wasn't supposed to be a coronavirus: The quest for an influenza A (H5N1)-derived vaccine and the limits of pandemic preparedness." *Centaurus* 62, no. 2 (2020): 331-343.

The COVID-19 pandemic has raised questions about what efforts were made across the world to prepare governments and healthcare systems for such an event. This spotlight article looks at developments made in "pre-pandemic preparedness planning" following a number of outbreaks of influenza type A virus in 1997. At that time, a specific avian influenza subtype, referred to as A(H5N1), wreaked havoc among fowl but also infected humans through direct transmission. The potential for slight genetic mutations that could make A(H5N1) more infectious, allowing human-to-human transmission, presented the threat of a deadly influenza pandemic. As a result, the U.S. government (and others coordinating through the World Health Organization) launched a pandemic preparation plan, including strategies to develop vaccines against A(H5N1) and its genetic lineages each year. This spotlight article discusses the events that led to the specific concern about A(H5N1) among public health officials, as well as early efforts to derive and stockpile an appropriate vaccine to protect against a possible pandemic.

This perspective presents the challenges the world has faced, in recent history, in striving to keep one step ahead of pandemic threats.