

**Increasing Vaccination Rates in Oregon:
Novel Approaches to Combating Seasonal Influenza**

A CAPSTONE PROJECT REPORT IN THE
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Table of Contents

Executive Summary	5
Background	6
Importance of Vaccination	6
Barriers to Vaccination.....	7
Socioecological Model	7
Methods.....	9
Interventions	9
Using emergency medical service (EMS) providers as vaccine administrators.....	10
Establishing drive-through vaccination clinics.....	14
Creating a communication material toolkit	16
Discussion	21
Using EMS providers as vaccine administrators	21
Establishing Drive-Through Vaccination Clinics	22
Communication material toolkit.....	23
Socioecological Model.....	24
Potential Outcomes	25
Future Considerations	27
Conclusion	29
References.....	30
Appendices.....	33
Appendix A	33
Appendix B	34
Appendix C	35
Appendix D	37
Appendix E.....	38
Appendix F.....	40

Executive Summary

This report provides the reasoning behind, and guidance on, implementing three interventions aimed at increasing vaccination rates against seasonal influenza, with special considerations taken to account for additional challenges posed by the COVID-19 pandemic. The research draws attention to the importance of vaccines in preventing or decreasing the severity of influenza infections to protect our health and healthcare systems. However, research shows that there are many obstacles that prevent people from getting vaccinated, which include lack of established care providers; lack of health insurance; fear of vaccinations due to mistrust of the government and historical trauma; discriminatory experiences with healthcare providers; and not being able to physically get to a vaccination site, whether that is due to lack of transportation or being residence-bound.

The interventions implemented to address these barriers include utilizing emergency medical service providers as vaccine administrators, establishing drive-through influenza vaccination clinics, and creating a toolkit of customizable communication materials for public health authorities. The steps that were taken to implement these programs are outlined and include supporting documents that the Oregon Immunization Program used. Strengths and challenges that have been gathered throughout implementation and operation processes are reported to help guide future adoption of these programs. These interventions were looked at through the lens of the socioecological model, with how different factors of a person's life affect their ability or decision to get vaccinated.

Although a comprehensive evaluation of these interventions is not attainable due to their ongoing nature and lack of reportable data received thus far, these interventions have the potential to increase influenza vaccination rates, especially among populations that historically have poorer health outcomes and are more vulnerable to influenza and COVID-19 infections. Future considerations for improving these interventions and their impact include creating better evaluation methods, so that they can be adapted to better support not only the current COVID-19 vaccine distribution planning, but also offer better data for seasonal influenza seasons and novel pandemics in the future. Key recommendations for these interventions include direct follow up with health agencies and stakeholders to get feedback. Communication between these agencies is critical throughout all steps, including during and after the program is in place, to ensure changes are being made as necessary to keep the interventions as efficient and impactful as possible. These strong relationships between health agencies and stakeholders should be cultivated as early as possible, and detailed needs assessments of the target communities should be implemented for maximum impact.

Background

Importance of Vaccination

Vaccinating against seasonal influenza helps to prevent infection, reduce transmission, and decrease the severity of cases, all of which help to limit hospitalizations and deaths among those who become infected. Not only are the vaccines effective, but they are the best method of prevention and control that is currently available (Houser & Subbarao, 2015). For the 2019-2020 influenza season, the United States saw between 39 and 56 million influenza cases which resulted in 410 to 740 million hospitalizations (*2019-2020 U.S. Flu Season: Preliminary In-Season Burden Estimates*, 2020). The Centers for Disease Control and Prevention (CDC) estimate that as many as 7.25 million illnesses, 105,000 hospitalizations, and 6,300 deaths were prevented during the 2019-2020 influenza season due to people receiving the influenza vaccine (*Estimated Influenza Illnesses, Medical visits, and Hospitalizations Averted by Vaccination in the United States - 2019–2020 Influenza Season*, 2020).

Despite their known importance, the current rates of vaccination against seasonal influenza are too low to see maximum health benefits. While studies have determined that herd immunity does have an impact on decreasing the prevalence of influenza each season, there is not yet enough evidence to provide a quantifiable level at which that occurs (Mertz et al., 2016). However, based on data from 13 previous influenza seasons, the United States' Healthy People 2030 goals indicate a target of vaccinating at least 70% of the population against influenza (Healthy People 2030, 2020). For the 2018-2019 influenza season, 62.6% children aged 6 months to 17 years, and 45.3% of those over 18 years of age, were vaccinated in the United States as a whole (*Flu Vaccination Coverage, United States, 2018–19 Influenza Season, 2019*). When looking at the rates of vaccination against seasonal influenza in Oregon alone, similar trends can be seen. Out of all 50 states and Washington D.C., Oregon ranked 27th with 61.0% of all children getting vaccinated, and 30th for adults with a rate of 45.1% for the 2018-2019 season (*2010-11 through 2019-20 Influenza Seasons Vaccination Coverage Trend Report*, 2020). ALERT Immunization Information System (ALERT IIS) reported 1.5 million influenza vaccinations given at the end of the season. However, the Oregon Immunization Program reports that ALERT IIS accounts for around 3/4ths of all influenza vaccinations given. After factoring in the estimated additional 375,000 doses that were not accounted for in ALERT IIS, the 2018-2019 season saw around 1.875 million Oregonians vaccinated, while 2.307 million were not (Oregon Health Authority, 2019). While rates are higher in Oregon for those 65 years and older, and those 18 years and older who are at high risk, the 2018-2019 rates for those populations of 68.1% and 48.5%, respectively, can still be greatly improved upon (*2010-11 through 2019-20 Influenza Seasons Vaccination Coverage Trend Report*, 2020).

Not only do these rates fall short of the target of 70%, the need for improvement becomes even more apparent when looking at the data based on race and ethnicity. For children across the United States, those who identified as Asian had the highest rates of vaccination at 71.2%, followed by Hispanic; White only, non-Hispanic; other or multiple races; and Black only, non-Hispanic children, with American Indian/Alaska Native children having the lowest rates at 58.5%. Adult populations had the highest rates of vaccination among White individuals at 48.7%, followed by Asian; other or multiple races; Black only, non-Hispanic; and American Indian/Alaska Native adults; with Hispanic adults having the lowest rate seen at 37.1% (*Flu Vaccination Coverage, United States, 2018–19 Influenza Season, 2019*). Oregon-specific rates reflect these disparities as well, with White only, non-Hispanic populations having the highest rates at 52.7%, followed by

Hispanic; Black only, non-Hispanic; and other or multiple races last at 42.3% (*2010-11 through 2019-20 Influenza Seasons Vaccination Coverage Trend Report, 2020*).

Influenza-related hospitalizations and deaths is most common among young children, elderly individuals, and those with co-morbidities, particularly cardiovascular diseases (Li et al., 2017). With 5.4% of the population being under 5 years of age, and 18.2% of the population being over 65 years of age, this puts over 995,000 Oregonians at risk of severe influenza-related illness (Census Bureau QuickFacts, 2019). Additionally, when looking at rates for cardiovascular diseases, Black and Hispanic populations have higher prevalence and morbidity rates when compared to White populations, putting them at a higher risk of severe influenza infections (Graham, 2015). This data shows that very young, elderly, and racial and ethnic minority populations are among the most important populations to reach in vaccination efforts.

Barriers to Vaccination

Despite recommendations for vaccinating as many people as possible against influenza, there are multiple barriers that stand in the way of this goal. This is especially true when looking amongst minority groups. Vaccination rates for Black and Hispanic adults aged 50-64 years and 65 years and older were significantly lower than White adults of the same ages (Lu, Qiao, Brown, & Wang, 2017). Additionally, vaccination rates for Black and Hispanic individuals older than 65 were at least 10 percentage points lower than their white counterparts for most years during the previous two decades (Bleser, Miranda, & Jean-Jacques, 2018). While this is a complex and multifactorial issue, possible explanations for these disparities include less access to healthcare services, mistrust of healthcare workers, racial biases by providers resulting in inadequate care, minorities seeing providers who are less inclined to give influenza vaccinations, and hesitancy towards the vaccination itself (Bleser, Miranda, & Jean-Jacques, 2018). A person's place of residency may also play a role in vaccination rates depending on factors such as ease of access to services, living in urban versus rural areas, and pre-existing health conditions of the residents (Nagata, Hernández-Ramos, Kurup, Albrecht, Vivas-Torrealba & Franco-Paredes, 2013). As such, despite the recommendations and efforts put forward to vaccinate everyone, it is not equitable or realistic for everyone to do so, which can cause problems in trying to control or prevent outbreaks of diseases. With the 2020-2021 influenza season facing unique challenges due to the concurrent COVID-19 pandemic and the increased focus on decreasing health disparities among vulnerable populations, new approaches to vaccine distribution have been put in place based on the successes and challenges seen in previous novel pandemics and influenza seasons.

Socioecological Model

The interventions outlined here address the barriers to vaccine access through the lens of the socioecological model. This model, which was first introduced by Urie Bronfenbrenner in the 1970s, looks at how a person's health is impacted by both internal and external factors that surround them each day. The model, which was expanded upon by McLeroy, Bibeau, Steckler, and Glanz in 1988 to include 5 interrelated yet distinct levels, is shown below in figure 1. Golden & Earp, 2012). The five levels include intrapersonal, interpersonal, institutional, community, and public policy influences, and all work to influence health behaviors. Interpersonal level factors are within an individual, such as their beliefs and knowledge, while intrapersonal factors are those that are influenced by relationships and the beliefs and knowledge of the people surrounding you. Institutional level factors relate to organizations, which could include their level of engagement and accessibility. The community factors relate to larger partnerships within your environment

that influence the population as a whole rather than on an individual level, and public policy is the level that is influenced by laws and advocacy for health topics. These levels all intertwine and impact how a person behaves in regard to health behaviors. Because it is often difficult to isolate these factors, from one another, the most successful health interventions address factors on multiple levels (Golden & Earp, 2012). The interventions implemented by Oregon Immunization program to improve vaccination rates primarily target intrapersonal, interpersonal, institutional, and community level factors.

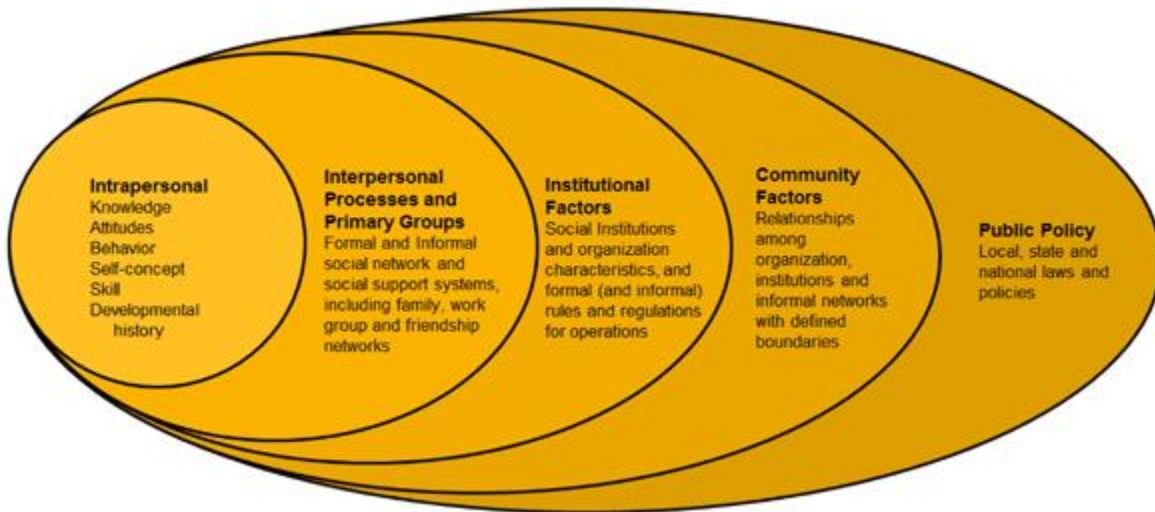


Figure 1. Levels of the Socioecological Model

Methods

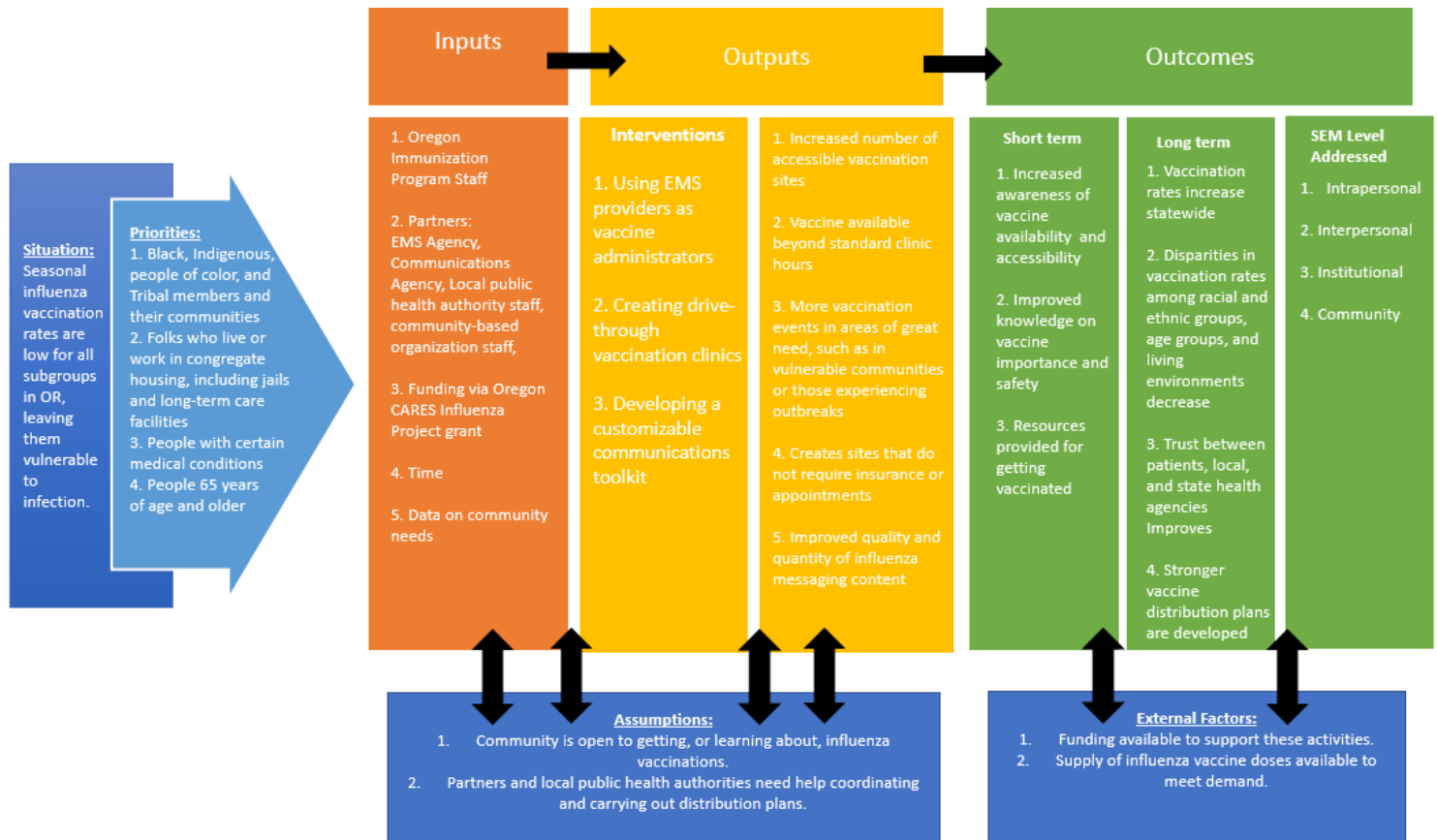
The outbreaks of COVID-19, the disease caused by the novel SARS-CoV-2 virus, further highlight the importance of seasonal influenza vaccinations. As they are both respiratory infections, becoming infected with one leaves a person more susceptible to the other, and puts them at an increased risk for severe symptoms (Khorramdelazad, Kazemi, Najafi, Keykhaee, Zolfaghari Emameh, & Falak, 2020). With these co-circulating viruses, it is imperative that as many people are vaccinated against influenza this season as possible.

The outlined interventions were supported through the Oregon CARES Influenza Project grant provided to the Oregon Immunization Program by the CDC. The funding from this grant was intended to support staffing changes within the Oregon Health Authority to keep up with the increased demand; support local public health authorities and Tribal communities and governments; create a media campaign with a communications and marketing agency; provide mini-grants to community health clinics and community based organizations that create novel approaches to preventing influenza and COVID-19 in their communities; and various other partnerships and contracts to improve the capacity of providing influenza vaccines statewide. Additionally, the CARES Influenza grant provided 70,000 additional influenza vaccines for adult populations starting in October 2020. These doses were intended to protect vulnerable populations most at-risk for COVID-19. This includes Black, Indigenous, people of color, and Tribal members and their communities; folks who live or work in congregate housing, including jails and long-term care facilities; healthcare and other essential workers; and people with certain medical conditions. They were to be provided at no cost, regardless of the person's insurance status, and to those aged 19 years or older, as those under 19 are guaranteed vaccines through the Vaccines For Children program. Not only did this help reach more adult populations to protect them from influenza and prevent further strain on the healthcare system, but it is also acted as a trial run for distribution and administration of the COVID-19 vaccine. The increased focus and efforts on distributing influenza vaccines for the 2020-2021 season help identify both existing strengths and gaps in the infrastructure which can then be better addressed before, or as, the COVID-19 vaccine is distributed.

Interventions

Three main interventions were used, which include using Emergency Medical Services (EMS) agencies as distributors and administrators of vaccines; providing vaccinations at drive-through clinics; and creating a more culturally tailored, customizable communications toolkit for local public health authorities to use to more effectively encourage getting vaccinated to their community members. Figure 2 below portrays a logic model that summarizes the inputs and expected outputs of the outlined interventions.

Figure 2- Logic Model



Using emergency medical service (EMS) providers as vaccine administrators

This intervention was developed as a result of the challenges and success seen in Oregon’s response to the H1N1 pandemic of 2009, the last novel pandemic present in the state. A study that analyzed a similar project using EMS services from that pandemic stated that the “project demonstrated that utilizing paramedics and ambulance services to vaccinate homebound/vulnerable populations is an effective way to reach an otherwise difficult to access patient population” (Baird, Bollinger, & Giard, 2010). The project was developed through the collaboration of the Oregon State Ambulance Association president, state EMS director, state EMS medical director, state immunization coordinator, and Oregon Department of Human Services Public Health Division community health director.

Oregon law allows this intervention due to the increased scope of practice for EMT-intermediates and paramedics. The relevant practice guidelines can be found under OAR Rule 847-035-0030, 11 (c) and (d), which state that those professionals are able to:

- (c) Prepare and administer immunizations in the event of an outbreak or epidemic as declared by the Governor of the state of Oregon, the State Public Health Officer

or a county health officer, as part of an emergency immunization program, under the agency's supervising physician's standing order;

(d) Prepare and administer immunizations for seasonal and pandemic influenza vaccinations according to the CDC Advisory Committee on Immunization Practices, and/or the Oregon State Public Health Officer's recommended immunization guidelines as directed by the agency's supervising physician's standing order.

Purpose: Based on the information collected in the aforementioned H1N1 study, the biggest challenges for distributing vaccines in Oregon were with homebound and care facility-bound individuals (Baird, Bollinger, & Giard, 2010). If the person is not able to leave their residence, they may not be able to access vaccinations as easily, therefore increasing their risk of becoming infected and spreading the virus to others. Additional challenges preventing vaccination include lack of insurance, not having an established healthcare provider, and lack of transportation to vaccination sites.

Based on the socioecological model, this intervention focuses primarily on the institutional level. This includes addressing the barrier of people not having a provider that they regularly see, which is one cause of not getting vaccinated. Because the EMS events are planned in areas deemed of high need, it also allows for these services to be available in an area that otherwise might not offer vaccinations. Lack of insurance is another obstacle that people face in accessing vaccines, and the CARES Influenza grant allows EMS services to offer these doses free of charge, therefore removing that barrier. It is desired that by removing these barriers and offering more accessible ways for people to get vaccinated, immunization rates for seasonal influenza will increase.

Population of interest: While this intervention was accessible by all Oregonians, it paid special attention to residence-bound individuals, such as those living in long term care facilities, correctional facilities, and those who are in personal residences but cannot leave. As of 2019, there were around 21,600 adults living in care facilities and 14,900 adults in correctional facilities, meaning this intervention primarily aims to reach these 36,500 people (Department of Corrections: State of Oregon, 2020; Oregon Department of Human Services Aging and Disabilities, 2019).

Basic steps for implementation

1. The first step is to determine the best EMS agencies to partner with, and develop a contract that outlines the partnership.

For this intervention, Oregon Immunization Program partnered with Metro West Ambulance Services and American Medical Response, as those were the agencies that were utilized in the previous H1N1 project. Metro West Ambulance Services was contacted in August 2020, and American Medical Response in September 2020, to discuss contract details and project outlines for influenza vaccine distribution. For state health departments that do not have previous experience working with EMS agencies in this capacity, the following questions are things to consider to determine which agencies may best suit the vaccine distribution needs of the state:

- What agencies have the largest reach across the state?

- What existing connections are there between the state health authorities, local public health authorities, EMS agencies?
- What agencies have the best capacity, in terms of resources, staffing, and other considerations, to take on multiple missions in addition to their routine calls?
- Are any EMS agencies currently enrolled as vaccine providers, thereby speeding up the enrollment processes?

2. EMS agencies must be enrolled as vaccine providers once it has been determined with which agencies the partnership will occur.

The document that Oregon Immunization Program used to complete this process can be found in appendix A. This document, along with the documents that are linked within, cover all of the required steps needed to verify eligibility as vaccine providers, which include:

- Confirming that the organization has proper storage and handling capabilities. The influenza vaccine must be kept in refrigerators that maintain a temperature between 2 and 8 degrees Celsius. This must be confirmed by submitting at least one week's worth of maximum and minimum daily temperature logs and continuous tracking temperatures from a primary and backup refrigerator.
- Training all relevant staff members to use ALERT IIS. All vaccine providers must be signed up for, and properly trained in, managing the ALERT IIS data for the organization. This training includes basic user training, super user training, and inventory training.
- Ensuring relevant staff has completed the vaccine management trainings. These trainings are required for the primary and back-up vaccine coordinators to ensure they are well equipped to prepare, store, and administer vaccines.
- Outlining the vaccine emergency plan. The requirements for this section are outlined in "Section 6: Vaccine emergency plan" in the Vaccine Management Guide (see appendix B). *Please note that these documents and the links they include were developed for use in enrolling providers in the Vaccines for Children program, and they have been altered to meet the needs of the CARES Influenza program enrollment. As a result, not all of the information included in these documents is applicable to the CARES enrollment process, and any extraneous information for vaccines other than influenza may be ignored.

3. Once an organization is enrolled as vaccine providers, they must be allocated vaccine doses.

Using ALERT IIS, providers must request the number of vaccine doses that they deem necessary, as well as their preferred dose presentation. Once that is processed and approved by an Oregon Immunization Program staff member, the doses will be shipped to the address provided in ALERT IIS.

4. Once the EMS agency is ready to administer vaccines, collaborate with local public health authorities to determine where their services can be utilized.

Oregon Immunization Program worked with local public health authorities and community-based organizations to determine what areas needed EMS services. All details related to planning and setting-up the event were to be handled by the sponsoring organization. Relying

on local public health authorities and community-based organizations to dictate where EMS services could best be utilized in their communities was found to be a better approach because they have deeper insights into the needs of their area, as opposed to Oregon Immunization Program which has a broader scope. Oregon Immunization Program acted as the liaison to connect local public health authorities and community-based organizations with the EMS services. Local public health authorities and community-based organizations took factors such as the following into consideration when determining the best areas to utilize EMS services:

- Areas that were experiencing higher rates of influenza infections, thereby increasing the severity of need for vaccinations;
- Organizations or events that were looking to offer influenza vaccinations, but did not have the staffing capacity or proper medical licensing to do so;
- Organizations that were not registered as CARES influenza providers, and therefore could not request their own allocations of vaccines.

5. When an organization required the use of EMS services, an official task order was sent on behalf of the sponsoring local public health authorities or community-based organization.

Task orders required the following information to be provided by the sponsoring organization:

- The name and address of the facility at which the event was to be held
- The date and time of the event
- The estimated number of patients to be vaccinated
- The information for the on-site facility contact
- The location at which the EMS provider wants the vaccines to be shipped to
- The Oregon Health Authority Regional Emergency Coordinator

If the EMS agency did not have current possession of vaccine doses available to use, events could not be scheduled sooner than 7 to 10 days to allow for shipments to arrive. If the EMS agency had possession of vaccine doses, an event could be staffed in as little as one hour.

All data entry for ALERT IIS was recorded by the EMS providers, and had to be submitted within 14 days of vaccine administration. EMS providers were also responsible for providing all ancillary vaccine supplies, personal protective equipment, and portable vaccine storage equipment.

6. Additional considerations were made to follow COVID-19 prevention guidelines.

All supplies used that are frequently exchanged between providers or patients should be easy to clean, or be in large enough quantities to avoid sharing. Examples of these would be plastic clipboards that can easily be wiped down, and having enough pens available to avoid reuse. Additionally, enough personal protective equipment should be brought to sufficiently protect all providers coming into contact with patients, as well as extra facial coverings to provide to patients without one. Lastly, all events had to accommodate for drive-through

vaccination procedures, as outlined in the next section, or allow for enough space to ensure physical distancing requirements are met between people standing in lines.

Establishing drive-through vaccination clinics

While drive-through vaccination clinics were not a new concept, they were more widely adopted as a practice in Oregon as a result of the COVID-19 pandemic. Drive-through clinics allowed for better adherence to the COVID-19 prevention guidelines, which includes maintaining a distance of six feet between people. To maximize the efficiency of time spent planning events, resources used, staffing capacity, and ease of access for the public, drive-through influenza vaccination clinics were added on to pre-existing COVID-19 testing events. While this concept was adopted and used by many different organizations statewide, the steps outlined here are based upon Oregon Immunization Program's process in working with local public health authorities.

Purpose: The drive-through vaccination clinics were put in place to offer easily accessible, COVID-19 conscious spaces in which people are able to get vaccinated against seasonal influenza. The clinics were often held on weekends or hours that extended beyond clinic office hours, offered walk-up and drive-through options, offered to everyone regardless of insurance status, and did not require prior appointments, which are all issues found on the institutional level of the socioecological model that prevent easy access to vaccines. The presence of these events in communities with high incidence and prevalence rates may also encourage people to get tested and vaccinated by increasing their perceived sense of risk and awareness of circulation of these viruses in their area, both of which are factors found on the community level of the socioecological model. Lastly, increasing the number of people in a community who get vaccinated may help encourage others to get vaccinated, as interpersonal relationships and increased vaccine uptake in the people surrounding the patient may positively impact their own decision on whether or not to get vaccinated.

Population of Interest: While the events were available for everyone in the area to get testing and vaccinated, the events were chosen in areas that served higher numbers of people in populations more vulnerable to COVID-19. This was determined by the local public health authorities and their knowledge on the needs of their communities, as well as by using the Drive-Thru Vaccine Planning Consideration document created by Oregon Health Authority (see appendix C). The most common communities that held these events were those with larger populations of Spanish speaking individuals, migrant seasonal farmworkers, people experiencing homelessness, wildfire evacuees, American Indian/Alaska Native populations, and those living in areas with a high prevalence of COVID-19.

Basic steps for implementation

- 1. The first step was referring to the schedule of COVID-19 testing events planned in each county.**

These events were determined primarily by each local public health authority in all of Oregon's 36 counties, with help from Oregon Health Authority's COVID-19 testing team. This allowed the local public health authorities' knowledge of their specific community's needs to be at the forefront of the decision making in order to maximize the impact of the events. Some of the factors that influenced decisions on where events were held were:

- Where outbreaks were occurring, as areas with more COVID-19 cases had a greater need for testing events;
- Where there were vulnerable populations that otherwise did not have adequate access to testing or vaccinations, such as areas with a greater number of migrant seasonal farmworkers;
- Central locations within a community, and close to public transportation stops to allow for those without cars to attend;
- Locations with enough space to accommodate for a large number of cars, as well as unidirectional flow.

The dates and times of the locations were also chosen by the local public health authorities, so as to best meet the needs of their communities. They were often scheduled on weekends, or on weekdays with hours outside of normal business hours, to increase accessibility for those who cannot make it to clinics during business hours. These events could be recurring each week, or occur just once, depending on the need of the county.

Once these details and the schedule were finalized, they were put in a master calendar that tracked all COVID-19 testing events sponsored by local public health authorities.

2. Collaboration then occurred to offer influenza vaccinations at these testing events.

Oregon Immunization Program first contacted the local public health authorities to determine their level of interest and capacity to offer influenza vaccines at these events. If the local public health authority had the staffing capacity to provide vaccinations themselves, Oregon Immunization Program coordinated with them to ensure the following needs were met:

- Their vaccine provider enrollment process was complete. This ensured they were properly trained on storage and handling procedures, ALERT IIS, and vaccine administration and safety processes.
- The event was at least 2 weeks away. This helped ensure that there was enough time for the shipment of vaccine doses to arrive. If they already had vaccines in their possession, events could offer vaccinations at any time.
- They had enough supplies. Necessary supplies for these events include personal protective equipment, ancillary vaccine supplies, people staffing the event, and technology available for entering vaccine data.
- Necessary logistical changes were made. This includes changes to traffic flow, signage, required paperwork, and licensed vaccine administrators available to staff the event.

If the local public health authority indicated that they did not have the capacity to staff the vaccination portion themselves, EMS services could be utilized. Oregon Immunization Program would then connect the local public health authority with one of the EMS services to submit an official task order. The process would then proceed as described in the previous intervention.

3. While the majority of the event was already planned, certain changes were necessary to add on the vaccination component.

The layout of some events had to change to accommodate for additional vaccination stations. Maps detailing the flow of cars from the start of the event, to each station, and to the exit, with any additional needs factored in, such as parking areas for cars to wait the required 15 minutes of observation time if the driver is being vaccinated, were required. Maps were also required to show where certain staff members would be posted, including those distributing forms and traffic controllers (see appendix D for an example map). The layout must also include walk-up areas compliant with the Americans with Disabilities Act for those without cars, including flow of traffic for those not in cars, lines and waiting areas that allowed for physical distancing, areas that are accessible by wheelchair, signage for those not in cars, and safety measures to keep people away from the traffic.

Supplies needed included things such as all testing and vaccination supplies; clipboards and pens for paperwork; paperwork in English, Spanish, and any other possible languages based on target population for the event; signs to help direct people; and sufficient personal protective equipment and cleaning supplies to prevent the spread of COVID-19.

Other considerations that were needed to support the staff of the event. These considerations included things like tents that could be secured to protect against poor weather conditions; electricity sources if needed; translation and interpretation services; accessible bathrooms; internet source for entering data into ALERT IIS; and enough space for physical distancing between people.

Creating a communication material toolkit

In addition to mobility and accessibility issues, the study looking at H1N1 vaccination challenges in Oregon also identified poor communication and outreach as a limiting factor to vaccination rates among vulnerable populations (Baird, Bollinger, & Giard, 2010). While this study highlighted this barrier in people who are disabled and those who are residence-bound, other studies conducted by Oregon Health Authority after the H1N1 pandemic showed that improved messaging methods were important to better reach ethnic and racial minority populations (Oregon Health Authority, 2010). Because all of these populations have different perspectives, challenges, and histories with seasonal influenza vaccinations, marketing materials must be tailored to best appeal to specific circumstances for maximum impact. These studies, along with the document in appendix C, helped guide decisions on which populations to target in this intervention. Not only will this be beneficial in increasing vaccination rates this season when it is particularly important due to the co-circulation of COVID-19, but it is designed to be adapted and used for more influenza seasons in the future to continue the trend of improving vaccination rates.

Purpose: Due to historical trauma and discrimination, mistrust of the government, healthcare system, and vaccinations is common, especially among people of racial and ethnic minorities. This results in disparities in vaccination rates, which is particularly important this year as these are the populations that are also more vulnerable to COVID-19 infections and more severe cases. This intervention served to determine how to make messaging more impactful, thereby increasing the chance that it will help improve vaccination rates among the most vulnerable populations. By publishing accurate, culturally competent, and easily accessible information, this intervention aimed to overcome some of the reasons people choose to forgo vaccination.

When looking through the lens of the socioecological model, the intrapersonal factors addressed were a perceived risk of infection, attitudes towards vaccines, perceived efficacy of the influenza vaccine, and trust in providers and governmental agencies. Interpersonal factors were similar, as the more widespread the positive perception of influenza vaccines becomes, the greater the chance that people will be influenced to receive it. Raising awareness on how to access vaccines in each community helps address some of the institutional barriers, and information on the severity of influenza can help impact community level factors by increasing the perceived risk of the community as a whole.

Population of Interest: Entire population with special attention to Black, Hispanic, and migrant seasonal farm worker populations; urban and rural populations; and those that focused on people living in congregate settings, including long term care facilities and correctional facilities. As of 2019, there were around 92,800 Black and 656,200 Hispanic individuals, 174,000 migrant seasonal farmworkers, 1.485 million living in rural or frontier communities, and 36,500 resident-bound individuals in Oregon (Census Bureau QuickFacts, 2019; Department of Corrections: State of Oregon, 2020; *Migrant Health*, 2019; Oregon Department of Human Services Aging and Disabilities, 2019).

The Governor's Office of Oregon put out specific metrics to follow as guidance when planning vaccine distribution, which focused on decreasing the most prominent health disparities seen in vaccination rates (Sharief & Banks, 2021). The metrics were:

- Eliminate the disparity between the vaccination rates of Black and White populations entirely, which is currently at 6%
- Reduced the disparity by 10% between Latinx and White populations, which is currently 17%
- Increase the overall vaccination rates by 10% for those 65 years of age and older of all racial and ethnic groups when compared to previous influenza seasons

Basic Steps for implementation:

1. First, the needs of the communities were determined.

Based on previous studies conducted by Oregon Immunization Program, it was known that improving communication methods was one way that can improve vaccination rates. Those who are more vulnerable to influenza and COVID-19 infections are the same groups who historically face lower rates of vaccination, such as racial and ethnic minorities, elderly populations, non-English speaking individuals, and those in rural settings with fewer available options for which to get vaccinated. Additionally, a lack of a

2. Oregon Immunization Program then contracted with Brink Communications.

Brink Communications was an agency that Oregon Health Authority had previously worked with, and whose mission aligns with the goals of this intervention as they focus on urban innovation, healthy communities, and social justice.

The contract that was negotiated would use \$100,000, funded by the CARES Influenza Project grant, to cover all material development, photography and video recordings,

copywriting costs, and any additional research beyond the components mentioned here that were needed to complete this toolkit. This project would entail interviewing local public health authorities to get their feedback on what communication needs they have, whether that be the types of materials, the information to include, or accurate translation services.

Together, Oregon Immunization Program and Brink analyzed demographic data including racial and ethnic groups, age, urban versus rural spread, congregational living facilities, and languages spoken statewide to determine which counties to target. 16 out of 36 counties were selected to be interviewed, as the communities that these chosen local public health authorities serve provided a strong representative sample of the demographics present statewide.

3. Interviews were conducted with each of the chosen 16 local public health authorities.

The primary vaccine coordinator was contacted at each of the 16 representative counties and asked to schedule a time for a voluntary interview. The counties contacted were Baker, Benton, Clackamas, Clatsop, Deschutes, Douglas, Harney, Jackson, Jefferson, Klamath, Marion, Multnomah, Umatilla, Tillamook, Wasco and Washington.

Interviews with the primary vaccine coordinators were conducted over-the-phone by Oregon Immunization Program staff members, unless the county preferred to be sent the questions via email, to which they could respond with written answers.

The script asked questions to get their opinions on the success and challenges they saw with their previous communication materials, the effectiveness of the messages they put out, and what materials they thought would best help them moving forward (see appendix E). Interview questions sought to determine the best messaging for improving attitudes towards the influenza vaccine alone, in the time of COVID-19 pandemic response, and in light of the release of the COVID-19 vaccines, as these all granted differing opinions and attitudes

All interviews were recorded and transcribed to allow for accurate analysis.

4. The answers provided by the interviews were analyzed for prominent themes.

The answer for each question provided by each local public health authority was compiled into a single document and then sorted to reflect the most common answers. The following are the components that the surveys were asking about, as well as the most common responses:

- The biggest barriers in their communities that stop people from getting vaccinated. The most common answers were:
 - Lack of trust in the government as a result of historical trauma and discrimination
 - Language barriers and poorly translated materials which lessens the emphasis on the importance of vaccine
 - Myths surrounding vaccines, such as people thinking it is possible to get sick from the vaccine

- Costs associated with the vaccine
- Scheduling issues, both with not taking the time to book an appointment and not being able to make any of the available appointment times
- The approaches that make messaging most effective in encouraging people to receive the influenza vaccine. The most common answers were:
 - Highlighting the fact that getting vaccinated protects elderly populations, the overburdened healthcare system, the person's family and friends, and themselves from getting sick
 - This year, an emphasis was placed on not wanting to risk getting influenza and being at a high risk for contracting COVID-19
 - That the influenza vaccine is needed each year to cover different strains of the virus
 - Any messages that come from trusted individuals within the community, which may include physicians or the directors of community-based organizations
- The approaches that make messaging least effective in encouraging people to receive the influenza vaccine. The most common answers were:
 - Argumentative materials or those that rely on "scare tactic" statistics
 - Messaging that is not concise and easily digestible for the general public
 - Messaging that contains contradictory information, or confusing wording, when compared to influenza materials from other sources
- The types of communication materials that are most beneficial. The most common answers were:
 - Press releases, public service announcement scripts, and media outreach scripts
 - Radio, especially for Spanish speaking populations
 - Talking points and newsletters for providers or local public health authority staff members to use with patients
 - Interior signage and flyers
 - Social media content
 - Billboards
 - Text messages to remind patients when they are due for vaccinations
- Special considerations that should be made to better appeal to certain populations. The most common suggestions were:
 - Diversity in graphics, it was stated that there was good inclusion of people of different ages and racial groups, but there was a big disconnect in rural parts of the state due to urban-centric images
 - Messaging must be culturally competent and accurately translated, for example using "la influenza" in Spanish-translated materials instead of the more colloquial "la gripe" to indicate severity of influenza versus a cold
 - Using photographs instead of illustrations
 - Offering enough audio material to better reach populations with low literacy rates, especially in areas with larger Spanish-speaking populations
 - Providing materials in more languages, with the greatest needs after English and Spanish being Russian, Ukrainian, Vietnamese, and Somali

- With the high prevalence of COVID-19, photographs should reflect current prevention guidelines, such as physical distancing and facial coverings seen in the subjects of the pictures.

5. The toolkit was then published for use by all local health authorities and community-based organizations.

The survey results were sent back to Brink who then used them to guide their creation of the toolkit. The materials were published in both English and Spanish, and include the following materials:

- Press releases, public service announcement scripts, and media outreach scripts
- Radio, especially for Spanish speaking populations
- Talking points and newsletters for providers or local public health authority staff members to use with patients
- Interior signage and flyers
- Social media content

Both toolkits were published in January 2021 (see appendix F). Local public health authorities were sent the links and were free to customize and publish the materials according to their needs.

Discussion

Using EMS providers as vaccine administrators

Strengths: The strengths to adopting this type of approach for distributing and administering vaccines is that it decreases the burden that local public health authorities, community-based organizations, and residential care facilities face with limited staffing capacity, especially as a result of the additional needs posed by COVID-19. Similarly, if staff at these organizations are not the ones that have to provide the vaccines, it avoids the need to enroll as providers. By using EMS services, they are able to allow staff to focus on other responsibilities, and not have to take the time to go through the enrollment process. Having multiple EMS providers and locations at each agency also allows for fast responses. As mentioned, if they have vaccines on hand, they are able to confirm and staff an event within an hour. Lastly, the collaboration with local public health authorities allows for more specific insight and guidance on how to best serve each county, so this helps reach the target populations better than planning events through Oregon Immunization Program or the EMS agencies themselves.

Challenges: The biggest challenge that this intervention faces is the lack of awareness of the capacity of EMS by local public health authorities and community-based organizations, which leads to their services being underutilized. Because this approach is not common, many organizations do not know that using EMS to carry out their vaccination needs is an option, and therefore may not be vaccinating as many people in the community as they could be. This is also a difficult system to replicate in other states. Not all states include vaccinations within the scope of practice of EMS providers, so this would not be possible without changing the laws to include that. A determining factor for how successful this implementation will be is the relationship between the health agencies and the ambulance services (Baird, Bollinger, & Giard, 2010). In Oregon, because there was a pre-existing relationship between those two sectors, as well as an understanding of responsibilities and capacities, it can be a very successful system. However, the challenge is when this approach is looking to be adopted by a state that has more siloed sectors and no previous collaboration, as they will not be able to mobilize and operate as quickly or efficiently. Along the same lines, while Oregon is not currently facing challenges due to the high cost of utilizing EMS services because it is funded by the CARES Influenza grant, this may be a prohibiting factor in future years where there are less funds available, or for other states that do not have enough funds available. Lastly, while it was still early in the season, the only challenge that Robert McDonald at American Medical Response reported as of September 2020 was language barriers that they encountered with the patients. They offer all paperwork in both English and Spanish, and are able to use translation apps for basic communication needs, but this is one of the greatest areas for improvement to be able to better serve non-English speaking patients.

Next steps: Thus far, this intervention has only been used for events and scheduled trips to care facilities rather than on routine calls. Emergency use authorizations are required for paramedics to be able to carry and administer vaccinations on routine calls. An emergency use authorization is not present for seasonal influenza vaccinations, and there has not yet been a need to administer COVID-19 vaccines outside of scheduled events or visits to facilities. As Oregon moves into further prioritization phases, EMS will have the potential to vaccinate for COVID-19 on routine calls. This is important because this will further improve vaccination rates among those who are

not able to travel to events, and those who are not living in facilities that are being visited by the EMS agencies.

COVID-19 brings additional confounding factors that play into the rates of season influenza vaccinations this year making it difficult to determine what is having the largest impact on increasing those rates. However, because a solid framework will be especially important for evaluating its effectiveness in distributing the COVID-19 vaccine, the focus now should be on better ways of analyzing and evaluating the data and the impact of the intervention. Not only will this be important if the COVID-19 vaccine will be required annually, but it will also help provide better preparation for future pandemics.

Establishing Drive-Through Vaccination Clinics

Strengths: 40 testing events offered influenza vaccinations, which equated to around 10,000 influenza doses being offered to adult populations statewide. A success seen with the drive-through vaccination clinics is that it allows for better access for vaccines in populations that are harder to reach such as migrant seasonal farmworkers, racial and ethnic minorities, and those who do not speak English. Because these clinics do not require the person to see a doctor, the negative experiences and mistrust that may push vulnerable populations away from seeing healthcare providers does not always extend to these clinics, making these more desirable. Additionally, due to the fact that appointments are not needed, insurance is not required, and the hours are extended beyond standard clinic hours, these events were often more accessible to people who were affected by those limiting factors. Finally, with local public health authorities determining the location of the events, they had more potential to better reach the target population because they were tailored to suit the needs of the community. Even when taking into consideration the planning needs and challenges that may arise in a setting outside of normal vaccination circumstances, drive-through clinics are efficient ways for mass vaccination efforts against seasonal influenza, as well as helping public health better manage the planning related to the COVID-19 pandemic, or other disaster planning (Banks, Crandall, & Esquibel, 2013).

Challenges: One challenge was the lack of awareness about the influenza vaccine being offered at these events. Many local public health authorities chose not to mention that influenza vaccines were being offered in any of their outreach materials. This was done to avoid the need to reconfigure the logistics and flow of the event, which may have been necessary had the vaccination component been widely advertised, leading to more people showing up than what was originally anticipated. Instead, the people would be asked individually after receiving the COVID-19 test if they wanted the influenza vaccination as well. Due to the decreased capacity that most local public health authorities faced, this was overall a wise choice, as it still allowed some people to get vaccinated but did not overwhelm the event. However, this may have limited the reach and made it not as successful in vaccinating as many people as it could have been had it been advertised.

Next Steps: As more people become eligible to receive the COVID-19 vaccine, local public health authorities, CBOs, and EMS providers will all need to ensure they are registered as COVID-19 vaccine providers. There are additional considerations that are required for this

vaccine versus the influenza vaccine, such as different storage and handling equipment and procedures, additional health screening questions, and stricter ALERT IIS data entry requirements, meaning there are additional trainings and documentations required as well. Getting everyone that has been involved in sponsoring drive-through influenza vaccination clinics enrolled as COVID-19 providers as soon as possible will help make planning drive-through COVID-19 vaccine clinics more efficient. These events have already started occurring for the first phases of distribution, but developing more specific evaluation frameworks to identify gaps in vaccine access that these clinics can fill may help get the COVID-19 vaccine out to the general public at faster rates than what we saw with the influenza vaccines.

Communication material toolkit

Strengths: The main strength to this intervention is the fact that it is fully customizable for the to decide how to best reach their target populations. The most common themes that were extracted from the interviews are available to use and were inserted into the communication materials, but the local public health authorities are still able to make changes as they see fit. Providing these templates to all local public health authorities, and any community-based organizations who may be able to use them, makes it easier for them to publish content despite severe lack of time and resources, while also ensuring that the information that is put out in each county is uniform and relevant. This is particularly important, as confident language, highlighting importance in relation to the specific community, and targeting healthcare communication outlets are particularly effective at persuading both people who get the influenza vaccination annually and those who do not (Valley, Scherer, Knaus, Zikmund-Fisher, Das, & Fagerlin, 2019).

Challenges: The biggest challenge may be the lack of capacity within local public health authorities to be able to fully utilize this content. It was emphasized by multiple local public health authorities that, due to the increase in demand on their staff members due to COVID-19, there is little time or effort available to spend on improving or increasing the frequency of messaging. While this toolkit will help make the customization process more efficient, there is still work that will be needed on their end to get the materials out for the community to be able to see, and they often do not have enough staff available to properly take that on.

Another challenge is that, due to the time it took to conduct the research, write the information to be included, design the materials, hold the photography session, and go through the editing phases, this toolkit is being published later than what is ideal. With a publication occurring in January 2021, not only is this much later than the recommended time in an influenza season to be pushing vaccinations, but it also is occurring at the same time as the beginning phases of the COVID-19 vaccinations. While that does not mean that people should not still receive influenza vaccinations, it may not have as big of an impact as it could have had it been published earlier in the influenza season.

Next Steps: As it was just recently published, there is not yet any data on the impact these communication materials will have on the target communities and their decisions to get vaccinated. The focus now, as with the other interventions, should be on ways this project can be effectively evaluated to determine its impact. The original plan had been to interview community-based organizations as well, but due to limited capacity and lack of sufficient responses, their data was not able to be collected and applied to the toolkit development. Community-based organizations may be a good target for future research because they may have differing opinions and experiences

as they work with the community in a different way than local public health authorities do. Additionally, another area of focus that may be beneficial is looking at how to better appeal to diverse populations beyond racial and ethnic minorities. While the interview did not limit the questions to being about these populations, most of the input from local public health authorities was in relation to culturally relevant information and translation services. Some also mentioned the urban versus rural divide that could be better addressed, but other demographic groups could be studied as well. With homebound individuals being a big gap seen in the H1N1 studies and in the distribution of influenza and COVID-19 vaccines thus far, it may be useful to put more resources into figuring out the best way to reach those populations more than what has been done previously.

Socioecological Model

Factors in each level of the socioecological model can directly prevent someone from getting vaccinated. On an intrapersonal level, the pre-existing attitudes, beliefs, and knowledge they have about influenza vaccinations may encourage, or dissuade, them from choosing to get it. Similarly, the attitudes, beliefs, and knowledge their peers have has an impact, as well. The goal of the communication materials was to provide accurate, applicable information that is easy to understand to address these factors so a person is able to make a more informed decision. On an institutional level, if a person does not have an existing relationship with a provider, is not encouraged to get vaccinated by a provider, cannot make it to a clinic during standard operating hours, lacks health insurance, or does not have transportation to their nearest clinics, they are less likely to get vaccinated, and may benefit from drive-through vaccination clinics or EMS events hosted in their area. All three interventions address the community level of the SEM, as this level considers factors such as the circulation of influenza in the community, and the perceived risk of infection held by the community as a whole. Communication materials improve the knowledge and awareness of the status of their area in terms of influenza circulation, and the other two interventions provide easily accessible avenues through which people can take action to get vaccinated. The last SEM level, public policy, plays a significant role in vaccination rates, as well, but is not directly addressed by the interventions outlines here. Seasonal influenza does not currently have any vaccination mandates for the general public, and therefore does not influence the rates of the target populations discussed here, but an example of this is high vaccination rates among healthcare workers because there is a mandate for those in that profession.

Table 1. Summary of Socioecological Model Application

Level	Examples	How It Is Addressed
Intrapersonal	<ul style="list-style-type: none"> • Perceived risk of disease • Attitudes towards vaccine • Perceived efficacy of vaccine • Previous vaccine history • Trust in providers and government 	<ul style="list-style-type: none"> • Communication materials help by improving attitudes towards importance and safety of vaccines
Interpersonal	<ul style="list-style-type: none"> • Vaccine uptake by friends and family • Attitudes towards vaccine by friends and family 	<ul style="list-style-type: none"> • Communication materials help by improving attitudes towards importance and safety of vaccines

<p>Institutional</p>	<ul style="list-style-type: none"> • Having an established healthcare provider or lack thereof • Level of encouragement from providers to get vaccinated • Limited clinic hours and locations • Health insurance status • Lack of transportation with which to travel to clinics 	<ul style="list-style-type: none"> • Both the EMS and drive-through clinics improve accessibility by offering the chance to receive vaccinations regardless of whether a person has insurance, a provider, transportation, or time to go to an appointment
<p>Community</p>	<ul style="list-style-type: none"> • Circulation of influenza and COVID-19 in the community • Perceived risk of outbreak within the community 	<ul style="list-style-type: none"> • Communication materials discuss presence of both viruses within the community, as well as the importance of mitigating risk • Both the EMS and drive-through clinics are more prevalent in areas with more circulation of both viruses, therefore increasing accessibility and awareness of importance
<p>Public Policy</p>	<ul style="list-style-type: none"> • Vaccination mandates • Vaccination prioritization guidelines 	<ul style="list-style-type: none"> • While these interventions do not currently address this level

Potential Outcomes

These three interventions have the potential to improve vaccination rates for all Oregonians. However, because the specific obstacles they aim to eliminate affect the following populations at higher rates, it has more potential to improve rates specifically among those who:

- are resident-bound, such as those in long term care facilities, correctional facilities, or those who cannot access transportation;
- work during normal clinic hours;
- do not have insurance;
- do not have a current provider;
- and those are historically on the poorer outcome of disparities seen for vaccination rates, such as Black, Latinx, and elderly populations.

The current reports on influenza vaccination rates currently do not show what populations have been reached thus far and how it compares to previous seasons, as it is too early in the season and data analysis processes. However, overall, rates were promising. As shown by figure 3 and 4 below, there have been more influenza vaccines administered so far than at this time during the 2019-2020 season (Flu Bites, 2021). Additionally, figure 5 shows that there is minimal influenza circulation nationwide this season according to the most recent data published (Flu Bites, 2021). While these figures portray the desired outcomes of increased vaccination rates, it cannot be conclusively determined that they are a result of the implemented interventions. The beginning of the season saw higher rates of vaccination than in previous years, especially at peak vaccination times, but that since decreased into rates that are slightly lower. While this is a standard dip that is seen from year to year as the season progresses, this could also be a result of various different confounders affecting decisions both for and against vaccination this year, such as willingness to go to a clinic or other vaccination event given the circumstances of the pandemic; knowledge, or lack thereof, about these interventions; decrease in interest in influenza vaccines after the release of the COVID-19 vaccination, which occurred on December 14th, 2020 in Oregon; additional loss in staffing capacity due to the release of the COVID-19 vaccine; and little concern for influenza this season, since there is minimal circulation nationwide as shown in figure 5 below, among all of the usual factors that play into a person's decision whether or not to get vaccinated.

Figure 3

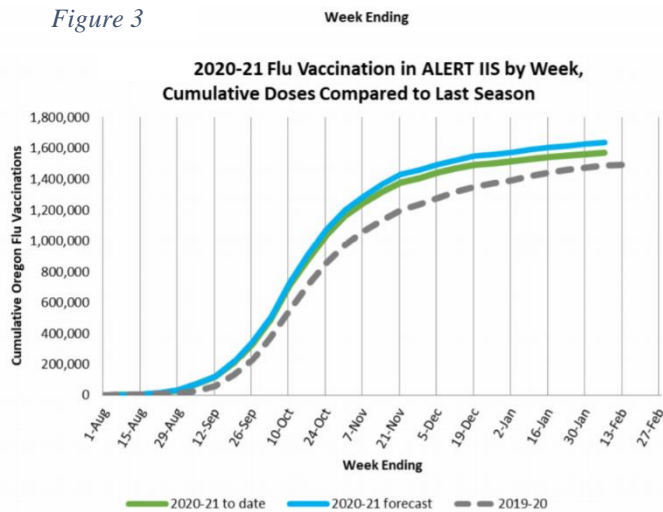


Figure 3

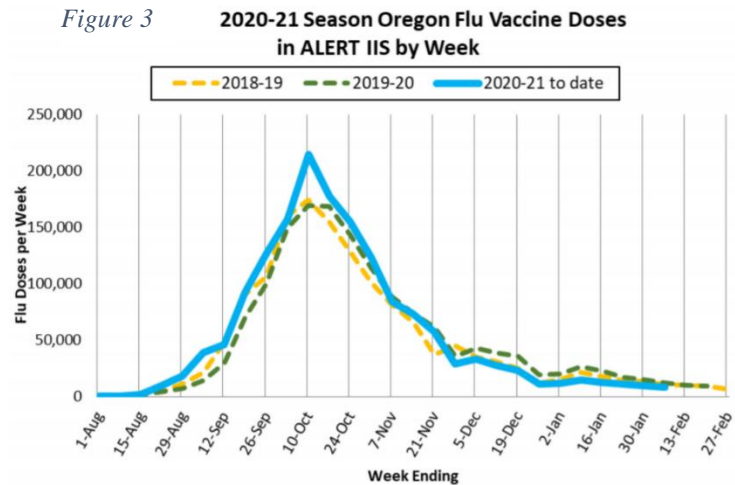
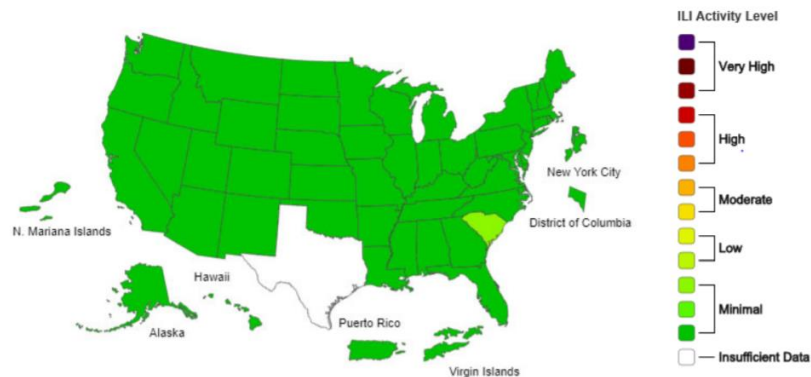


Figure 4 influenza-like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2020-2021 Influenza Season Week 06—Ending February 13, 2021



Map above: This map uses the proportion of outpatient visits to ILINet sentinel providers for influenza-like illness to measure the ILI activity level within a state. It does not, however, measure the extent of geographic spread of influenza within a state. Therefore, outbreaks occurring in a single city could cause the state to display high activity levels.

While it is difficult to say whether or not these interventions made any differences this year, the potential for their impact is significant. With 79.5% of the population of Oregon being over 18 years of age, and 45.1% of those getting vaccinated against seasonal influenza in the 2018-2019 season, an increase of only 1% would see an additional 33,570 people vaccinated (Census Bureau QuickFacts, 2019; Flu Bites, 2019). It is currently estimated that for every 4,000 people vaccinated, one influenza-related death is prevented (Fireman, Lee, Lewis, Bembom, van der Laan, & Baxter, 2019). Even a slight increase in vaccination rates of 1% statewide has the potential to save 8.4 adults lives.

For the 2020-2021 influenza season specifically, increased vaccination rates have the potential to protect the overburdened healthcare system by keeping influenza-related hospitalization rates low, thereby preserving resources and time which can be used on patients infected with COVID-19. Higher influenza immunization rates may decrease COVID-19 cases by keeping immune systems high, decrease the number of influenza-related deaths, and decreasing the severity of influenza infections. Lastly, by putting plans in place for how to reach more adult populations than ever before in immunization efforts with these interventions, it allows for the possibility of more efficient, widespread distribution and administration of the COVID-19 vaccine. While that vaccine is not directly related to how many people get the season influenza vaccination, all efforts toward improving the accessibility to, and attitude towards, vaccines places Oregon in a better place for decreasing cases, hospitalizations, and deaths of both respiratory diseases.

Future Considerations

For all of the interventions, it is difficult to determine whether or not these interventions had the desired outcome due to so many factors affecting vaccination rates, as well as not yet having enough data to make conclusions. Interventions developed in the future should start with a plan for evaluating its outcome, as this will help prevent wasting time and resources on interventions that are not effective. Trying to isolate and evaluate factors that affect influenza immunization rates can be difficult due to so many confounding factors, but it would likely be easier to

evaluate them if that had been considered from the start, rather than trying to develop an evaluation plan after the intervention has been implemented.

Another factor to take into consideration in future years is consistent encouragement for vaccinations from the start of the influenza season in early fall, all the way through to the end of the season in May, as well as offering places to get vaccinated at any point within that time period. These efforts were strong earlier in the season, but tapered out around December following the anticipation and subsequent release of the COVID-19 vaccine. While that vaccination is also important, and limited capacities led to shifting the focus, it is important that influenza is kept in mind throughout the season so as to keep circulation low. This is even more critical in future seasons where circulation may be higher as COVID-19 prevention guidelines start to become more relaxed and sanitation and infection prevention practices start return to normal.

By putting these interventions in practice now for influenza vaccinations and the early phases of COVID-19 vaccinations, it will be easier to look at what gaps are present in reaching people across the state, and how these interventions can be adapted to continue to fill those gaps in accessibility to make it easier to distribute the COVID-19 vaccine. Without a solid evaluation framework based on data, it might be beneficial to contact the primary vaccine coordinators at the 13 counties, as well as the EMS agency leads, to discuss their opinions on how well the communication materials, EMS services, and drive-through clinics impacted this influenza season.

Conclusion

With a lack of sufficient evaluation frameworks in place, a key recommendation for these interventions could include following up directly with the involved agencies. Following up with EMS providers, local public health authorities, and leaders at affected community-based organizations to get feedback on strengths, challenges, and suggestions that may not be shown in the data. Communication between these agencies is critical throughout all steps, including during and after the program is in place, to ensure changes are being made as necessary to keep the interventions as efficient and impactful as possible.

Based on the successes as seen in previous pandemics, as well as the similar studies referenced within the discussion, these interventions have the potential to significantly impact the rates of vaccination against seasonal influenza. When creating approaches that directly target obstacles faced by minority populations, it may also succeed at decreasing the disparities seen among vaccination rates between populations of different races and ethnicities, ages, place of residence, language spoken, and socioeconomic status. As a result, the interventions carried out by Oregon Immunization Program may have success when adopted by other state or local public health authorities. To increase the probability of success, strong relationships should be created early on in the process to ensure there is sufficient collaboration among health agencies for effective planning and implementation. Additionally, detailed, community-led needs assessments are critical to ensure the interventions are targeting the right people in an effective way to have the maximum impact on health outcomes, and to ensure all state and local health agencies and community-based organizations have the knowledge and resources needed to successfully carry out the plans.

Improving access to, knowledge of, and attitudes towards seasonal influenza vaccinations has the potential to reach the desired 70% vaccination rates to greatly decrease the level of influenza circulation each winter, and therefore prevent unnecessary influenza-related illnesses, hospitalizations, and deaths.

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Appendices

Appendix A

Provider Enrollment Checklist

Oregon Immunization Program. (2020). CARES Flu Vaccine Provider Enrollment Checklist.
[CARES Flu Vaccine Provider Enrollment Checklist- Final.pdf](#)

Appendix B

Vaccine Management Guide

Oregon Immunization Program. (2019). Vaccine Management Guide.

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/VACCINESIMMUNIZATION/IMMUNIZATIONPROVIDERRESOURCES/VFC/Documents/VFCVacMgmtGuide.pdf>

Appendix C

Drive-Thru Vaccine POD Planning Considerations- COVID Pandemic and Influenza Vaccine
 created by Oregon Health Authority

Ensuring Health Equity - When hosting a Drive-Thru testing and vaccination clinic, health equity and equitable dispensing of vaccine is a deciding factor on location. Provided below is a table from the National Academy of Sciences [Framework for Equitable Allocation of COVID-19 Vaccine](#) book describing the impact of COVID-19 on certain populations.

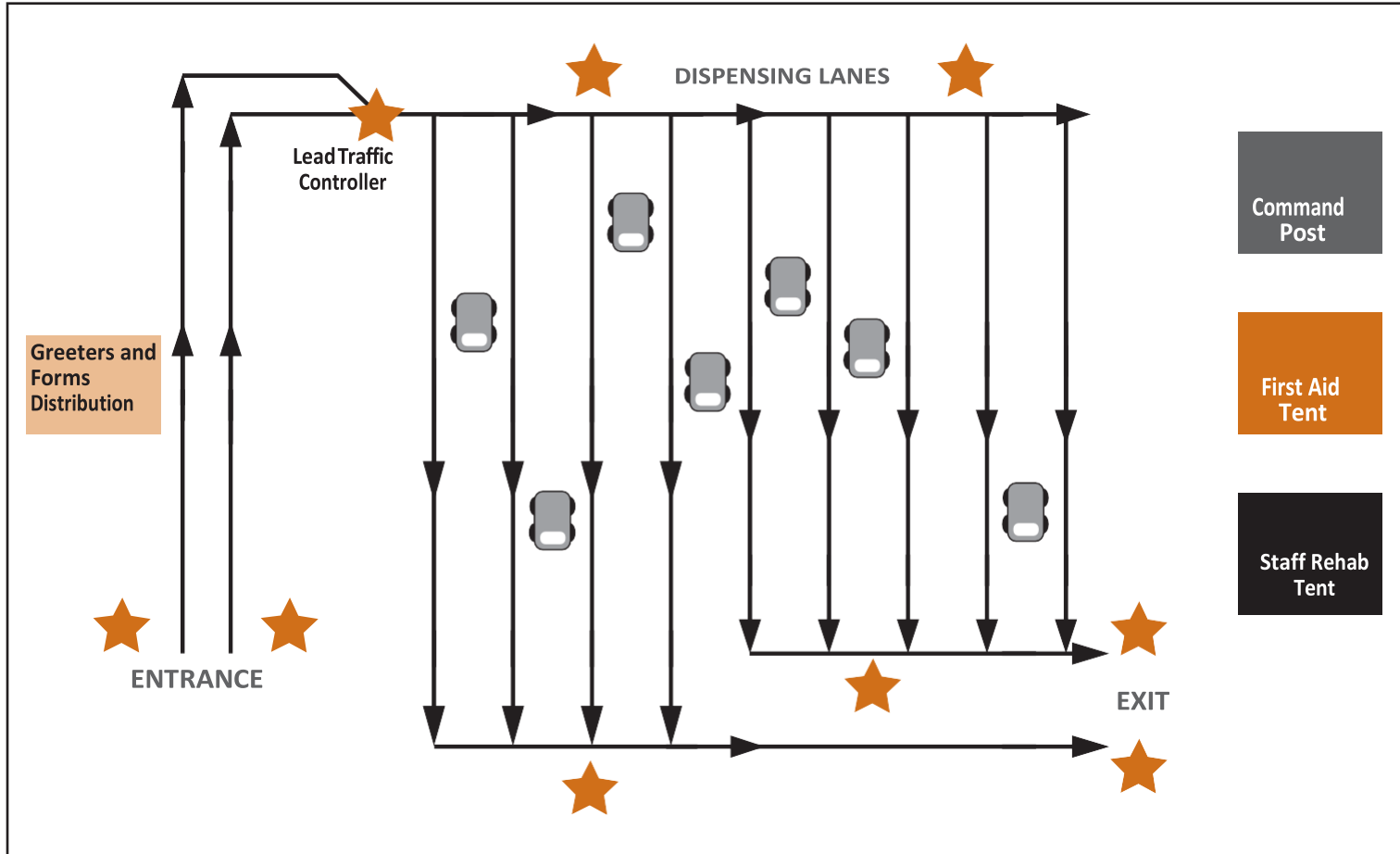
Population	Key Impact Data
Black	<ul style="list-style-type: none"> Compared to non-Hispanic White populations, this group has a case rate that is 2.6 times higher, a hospitalization rate that is 4.7 times higher, and a death rate that is 2.1 times higher (United States).
Hispanic/Latinx	<ul style="list-style-type: none"> Compared to non-Hispanic White populations, this group has a case rate that is 2.8 times higher, a hospitalization rate that is 4.7 times higher, and a death rate that is 1.1 times higher (United States).
American Indian and Alaska Native	<ul style="list-style-type: none"> Compared to non-Hispanic White populations, this group has a case rate that is 2.8 times higher, a hospitalization rate that is 4.6 times higher, and a death rate that is 1.4 times higher (United States).
Native Hawaiian and Pacific Islander	<ul style="list-style-type: none"> Group has experienced mortality from COVID-19 at a rate up to five times its proportion of the population compared to the general population (United States).
Older adults (≥65 years)	<ul style="list-style-type: none"> Group accounts for approximately 80 percent of reported deaths related to COVID-19 (United States). Population-level COVID-19 mortality risk is estimated to be 16- to 52-fold higher (United States) and 30- to 100-fold higher (worldwide) for this group than for younger people.
Older adults (>80 years)	<ul style="list-style-type: none"> Group is experiencing a mortality rate 5-fold greater than average (United States). Group is experiencing an “overwhelming percentage” of severe outcomes due to COVID-19 (worldwide).
People with underlying or comorbid conditions	<ul style="list-style-type: none"> Group is 6-fold more likely to be hospitalized and 12-fold more likely to die from COVID-19 as people without underlying conditions (United States). Group is at a greater risk of SARS-CoV-2 infection.

Population	Key Impact Data
People who live congregate and/or work in settings	<ul style="list-style-type: none"> • Older adults living in senior living facilities are at high risk of severe COVID-19. • Long-term care facility residents accounted for half of >10,000 COVID-19 deaths reported by April 2020 (United States).
Sex	<ul style="list-style-type: none"> • Men with COVID-19 are more at risk for worse outcomes and death than women, independent of age (China).
Children	<ul style="list-style-type: none"> • Children and adolescents account for 10 percent of COVID-19 cases and less than 0.3 percent of deaths (United States). • Among children with COVID-19, 1.8 percent of cases resulted in hospitalization (United States). • 78 percent of deaths among adolescents (under 21) reported to the Centers for Disease Control and Prevention between mid-February and the end of July 2020 were people from Black, Hispanic and Latinx, or American Indian and Native Alaskan communities.
People who are pregnant or breastfeeding	<ul style="list-style-type: none"> • Group may be at an increased risk of developing severe COVID-19 disease that requires intensive care unit admission and mechanical ventilation. • Black and Hispanic women who are pregnant appear to be disproportionately at risk of severe disease and hospitalization (United States). • Babies born to women infected with SARS-CoV-2 during pregnancy appear to be more likely to be born preterm or require neonatal intensive care.

NOTE: The following groups are omitted from the table above due to a lack of COVID-specific epidemiological data: people who are undocumented, people with mental and physical disabilities, and people experiencing homelessness.

Appendix D

Sample Map for a Drive-Thru Vaccine POD- COVID Pandemic and Influenza Vaccine created by Oregon Health Authority



★ = Traffic Controllers

Appendix E

Brink Communications Local Public Health Authority Interview Script

Hello, my name is _____ and I'm working with the Oregon Health Authority Immunization Program. I would like to start off by saying thank you for talking with me today and to let you know that this call should last no more than 30 minutes. This call is regarding the development of a toolkit of digital and print materials to help public health officials and their partners to encourage their communities to get the flu vaccine. We are seeking your input because you are one of the stakeholders we are reaching out to from public health authorities across the state to help guide us as we develop the contents of the toolkit.

Do you have any questions?

Consent to Participate Statement:

Participation in this interview is entirely voluntary and will not influence current or future funding from Oregon Health Authority or any other service provided by the Oregon Immunization Program to individuals or activities carried out by local health departments.

There are no foreseeable potential negative consequences to participation.

Potential benefit to participation may include a more useful and meaningful toolkit of communications materials for you and your staff. Ultimately, our hope is that the communications materials help increase the rate of immunizations in Oregon.

I am taping this interview to make sure that I don't miss anything and so that I can concentrate on your answers and my follow-up questions instead of taking notes.

The tapes will be transcribed, and the documents associated with the interview and the final report will be kept on a secure folder on the Immunization Program's internal server. The recordings will be erased. Is it okay with you that we continue while being recorded?

Do you have any questions before I start the interview?

Let's start by talking about the resources and strategies currently in place to communicate to the communities you serve about the importance of flu vaccines.

- What resources currently exist to communicate about flu vaccines in your community?
- Who are these resources intended for? Who is using them on a regular basis?
- Where do these resources come from?
- What resources or tools do you find are most effective in communicating with the communities you serve about flu vaccines?
- What resources do you wish were available to help you communicate about flu vaccines?

[CONTENT & RESOURCES– 5-10 minutes]

Our work is to create a toolkit of communications resources that public health officials can use to help make sure people have the information they need to get a flu vaccine.

- Which of the following resources, if any, do you think would be most useful as you and your partners communicate about the flu vaccine?
- Some possibilities for toolkit resources include:
 - Printable handouts and flyers
 - Customizable postcards or mailers
 - Interior signage and posters
 - Templates for paid advertising
 - Public service announcement scripts
 - Social media graphics and sample posts
 - Sample email copy
 - Talking Points for providers to use when talking to patients or other stakeholders
 - Templates for media outreach, including press releases and emails
 - Presentation slides
- What additional resources would be helpful?

[FLU VACCINE MESSAGES – 5-10 minutes]

- What are the most significant barriers to getting the flu vaccine among the populations you work with?
- Among the populations you work with, what are the greatest motivators for people to get the flu vaccine?
- What specific concerns or motivators have you noticed during the COVID-19 pandemic?
- What messages are most effective as you talk to people about getting the flu vaccine?
- What messages are not at all effective?
- What messengers are most effective in communicating about the flu vaccine? Who do people trust?

[CONCLUSION – 2 minutes]

- What opportunities do you see for communicating about flu vaccines that we haven't discussed?
 - *NOTE: If the interviewees bring up strategies like media outreach or paid advertising, let them know that the Immunization Program has already provided funding to local public health authorities as part of the CARES flu program that can be used for paid media, and the governor's office will be launching a statewide seasonal influenza media campaign this Fall. The toolkit that we will provide in December could potentially include templates for ads or media outreach that they could use in their own outreach and campaigns.*
- Are there any cautions or concerns you think we should know about as we create new flu vaccine communications materials?
- Do you have any final advice you'd like to share?

[THANK YOU – 1 minute]

Thank you again for your time today. We look forward to sharing the communications toolkit when it's ready toward the end of this year.

Appendix F

Final Brink Communications Toolkits- English and Spanish

<https://www.dropbox.com/sh/gplhiluezqxfj9h/AAAr9zCHredQ9KCGKDSBnQ3ma?dl=0>