Operation CoVER STL (Covid-19 Vaccine in the Emergency Room for Saint Louis)

Category of submission (select as many as apply):

Reducing Disparities

IOM Domains that this project addresses (select as many as apply)

Patient Centered

Effective

Equitable

Please share how you defined your project. Consider addressing the questions below. (Max 500 Words)
What was the identified Quality Gap? - What was the improvement target? - What was the timeline of the project? - Who were the stakeholders? - What was the stakeholders' input? - What was the method for collecting stakeholder input? - What was the potential for significant impact to the institution? - What was the potential for significant impact to society?

COVID-19 viral transmission led to a worldwide pandemic that began to impact the United States in March of 2020. The COVID-19 pandemic has inequitably impacted resource poor areas of the country and minority populations. The Barnes-Jewish Hospital Emergency Department (BJHED) in Saint Louis, staffed by Washington University School of Medicine Emergency Medicine (WUEM) Physicians with dedicated pharmacy support serves such a population for the bi-state region of Missouri and Illinois. One of our strongest defenses against this novel virus has been vaccines. Development and more widespread distribution of vaccines began in Spring 2021. As the safety net for our community, the BJHED provides a multitude of healthcare, educational, and social services. At the time of project initiation, the state of Missouri ranked nationally in the bottom ten of states for population vaccination rates.

We began working with our hospital administration and pharmacy department to provide a novel opportunity to offer COVID-19 vaccinations to the public out of the BJHED. The goal was to provide a needed resource to our community for any/all patients (admitted or discharged) that came through the BJHED and consented to receiving a vaccine. The ED team offered at-the-moment healthcare access, confidentiality, patient-centered education, and access to follow-up resources. Multiple hurdles were identified and solved including vaccine storage, delivery, administration, record keeping, and provider training. We started offering COVID-19 vaccines out of the BJHED on July 21, 2021 (initially both Pfizer and Johnson & Johnson). Of note, this initiation date was well into the delta variant surge of the pandemic. Additionally, there was broad vaccination eligibility for the general public. We named our project: Operation CoVER STL (Covid Vaccine in the Emergency Room for St. Louis).

Vaccine education was provided to our physicians, advanced practice providers, and nurses. All were encouraged to offer every patient access to the vaccine. Subsequent doses to complete the initial vaccine series were followed up by our discharge nurse coordinators. Signage, educational materials, and advertising were also created to help our patients be aware of this free vaccination access in the ED. Weekly email reminders tracking vaccines administered and reminders were circulated to the WUEM physician/resident group. To our knowledge, this free COVID-19 vaccine

program by EM physicians with pharmacy support, based out of an Emergency Department, is novel in Emergency Medicine practice.

Please describe how you measured the problem. Consider addressing the questions below. (Max 500 Words)
What data sources were used? - Was a numeric baseline OUTCOME measure obtained? - What defined the sample size? - What counterbalance measures were identified? - What numeric baseline COUNTERBALANCES were obtained? - Was the outcome measure clinically relevant? - Was the outcome measure a nationally recognized measure?

Our ED census averages 185-240 patients daily with upwards of 90,000 patient visits per year. ED clinical practice is adept at ordering, administering, and documenting vaccines with the most common example being the TdAP (tetanus, diphtheria, and pertussis) which is administered almost daily in the ED for open wound prophylaxis in trauma patients. We have previously been involved with other public vaccination efforts including offering the influenza vaccine in prior "flu seasons" (with variable success). Based on regional vaccination rates and the healthcare access of our patient population, an assumption was made that approximately 1/3 of patients would arrive vaccinated. Also considering critical illness/trauma presentation, acute illness, vaccine hesitancy, and provider forgetfulness, we anticipated another 1/3 of patients that would not be available to consent for vaccination. Of the remaining patients, we discussed a vaccination goal rate of 5-10% (around 5-10 patients a day) and a stretch goal of 12-24 patients a day.

Our multidisciplinary ED team successfully vaccinated over 500 patients in the first three months of this program. As we continued to have success with Operation CoVER STL, we decided to generate a data cohort to demonstrate our impact on the surrounding community. We pulled data on regarding all vaccinated patients between July 1st, 2021 through January 20th, 2022. At that time, we had vaccinated n=874 patients. The average patient age was 44.4 years old. The distribution in ethnicity included 71.6% (626/874) Black patients, 25.6% (224/874) White patients, and 2.41% (21/874) American Indian, Asian, or "other" patients (Figure 1). The geographic distribution (based on listed home postal code) included 89.7% (784/874) Missouri patients and 9.61% (84/874) Illinois patients (Figure 2). Other represented states included Indiana, Kentucky, Mississippi, Tennessee, and Texas. Approximately 22% of the ED vaccinated patients were admitted and 78% were discharged. The average number of ED visits in the last 5 years per patient was 11 ED visits; demonstrating the unique role the BJ HED serves for health care in our regional community and why Operation CoVER was so impactful. We (WUEM) ARE the primary care physician for many of our regional patients. This practice is similar among other large urban areas with an Emergency Department fulfilling the role of "healthcare" entity for an underserved patient population.

We also reviewed data on adverse outcomes, specifically reviewing all medications provided during each patient encounter. Use of agents for anaphylactic reactions (epinephrine, corticosteroids, antihistamines) were limited in the patient cohort. Two patients received Epinephrine 0.3mg IM injections ("Epipens") during their ED stay, however both were unrelated to the vaccine administration (one presented to the ED after an insect sting and another with

angioedema as the presenting chief complaint, prior to receiving their COVID-19 vaccine). No other patient adverse events were reported.

Please describe how you analyzed the problem. Consider addressing the questions below. (Max 500 Words)
What was one factor contributing to the gap? - Were multiple factors contributing to the gap? - Was a structured root cause analysis undertaken? - What was the appropriate QI method or tool used for root cause analysis? - Was a root cause analysis performed prior to identifying potential solutions? - What was the rationale for selecting intervention(s)? - Did the project use a QI method or tool for selecting intervention(s)?

We were able to access data from the Centers for Disease Control (CDC) to help us analyze our impact on the region. We pulled the social vulnerability index (SVI) data for our impacted postal codes. Socially vulnerable populations are especially at risk during a public health emergency due to factors such as socioeconomic status, household composition, minority status, access to transportation, housing type, and lack of resources. The CDC uses this index to help determine where to leverage healthcare resources to help alleviate human suffering and economic loss (estimate supplies, need for emergency shelters, evacuation planning, required emergency personal). Our patient cohort postal codes were in high risk socially vulnerable regions. During the studied time frame of BJ HED vaccine administration, the state of Missouri had a rate of only 17% of our vaccinated (either receiving 1 vaccine or completing the series) patients living in the top regional quartile (for SVI) with an additional 32% residing in the 50th percentile region (for SVI) (Figure 3). This means that approximately 52% of our vaccination recipients were from socially vulnerable populations. The SVI rates help demonstrate that most patients served by BJ HED and WUEM providers are those with a higher impact from public health emergency and reside in areas in need of additional support. Please see our included maps demonstrating geographic impact on our region (Missouri and Illinois).

Please describe how you improved the problem. Consider addressing the questions below. (Max 500 Words)
What was the implementation of intervention(s) (date/time of go live)? - Was the target measure re-measured afterwards with comparison graph? - Was a structured plan for managing change used? - Was the project counterbalance re-measured with a comparison graph? - Was the counterbalance adversely affected? - Is the improvement in target outcome measure shown? - Was a statistical significance demonstrated in the outcome measure?

We evaluated CDC data on vaccination rates for COVID-19 vaccine uptake in Missouri during our ED-based initiative. On day 0 of Operation CoVER STL, 32.9% of the state population had received 1 dose of any COVID vaccine and 28.6% of the state population and completed the COVID-19 vaccine series (completed the 2-dose regimen for mRNA vaccines). On 1/20/22 (data cohort date) this rate had increased to 45.2% of the state population having received 1 dose of any COVID-19 vaccine and 39.0% of the population having completed the COVID-19 vaccine series (Figure 4). Programs such as Operation CoVER STL helped with this 12.3% increase in initial vaccination rates for the Missouri population (16.6% increase in completed vaccination series).

Data from Saint Louis City and Saint Louis County (the two largest surrounding regions) showed a 21.1% increase for St. Louis City and an 18.2% increase for St. Louis County for receiving 1 dose of the COVID-19 vaccine over this temporal period.

We have continued to offer Operation CoVER STL through our BJ HED. We now offer the Pfizer vaccine and booster(s) if eligible (removed Johnson & Johnson vaccine due to safety concerns). As we approach the one-year anniversary of the start of this initiative, we have now vaccinated over 1,125 patients to the current date (May 31st, 2022).

Please describe the control phase of your project. Consider addressing the questions below.
What were the lessons learned from the project? - Was there communication to stakeholders of the summary of the project, and lessons learned? - Was a process owner identified? - Did the process owner acknowledge ownership of ongoing monitoring? - What control measures were identified? - What was the reaction plan for deficiencies identified in the control measure? - Was there at least one year of sustained monitoring demonstrated? - Was the project successfully diffused in scholarly form (i.e. poster, manuscript, etc)?

Operation CoVER STL is a novel ED-based vaccination program that meets the needs of an underserved community with a high social vulnerability risk. As we continue to battle the current pandemic, we have expanded our vaccination efforts to include booster shots for eligible patients. Ongoing analysis of our patient cohort is undergoing to evaluate the true impact on our regional population through models looking at rates of avoidance of disease and hospitalizations/resource utilization. We are planning on continuing Operation CoVER STL as we hopefully begin to enter the endemic phase of the current health crisis. We have also begun to look at provider attitudes and support of this program through surveys. We hope our ED-based vaccination program can serve as a model for other Emergency Departments with similar socially vulnerable populations. We are actively preparing an abstract for national conference presentation and a manuscript for publication in an emergency medicine/critical care medicine journal.

Attachments

Operation CoVER STL