

Smart technology and education for smart protection against the Flu: Impact of a multifaceted QI intervention on influenza vaccination rates in children

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Introduction

- Influenza (flu) is a viral respiratory illness that is contagious and can result in severe illnesses, leading to hospitalization or even mortality. In the United States, 2017-18 has been the worst flu season since the 2009 pandemic, with 187 pediatric deaths, 80% of which occurred in unvaccinated children.¹
- Annual Influenza vaccine is presently, the only means available for prevention of this life-threatening infection and flu related pediatric deaths. However, low vaccination coverage rates for Influenza are a public health challenge in the United States and globally. World Health Organization not only declared vaccine hesitancy as one of the top 10 health threats in 2019, but recently highlighted that it is one of the urgent health challenges for the next decade.^{2,3}
- With rising anti-vaccine movements and with vaccine hesitancy emerging as a top global and national health concern, it is imperative that innovative measures to promote influenza immunization are studied. We studied the impact of a multifaceted QI intervention on influenza vaccination coverage rates across pediatric and adolescent patients evaluated at our tertiary care centers serving the underserved populations in Northcentral and Northwestern Iowa.

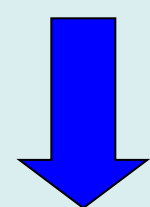
References:

- (CDC). Flu Vaccination Coverage, United States, 2018–19 Influenza Season. available from: <https://www.cdc.gov/flu/fluview/coverage-1819estimates.htm>
- (WHO). World Health Organization: Ten threats to global health in 2019. available from: <https://www.who.int/news-room/feature-stories/ten-threats-to-global-health-in-2019>
- World Health Organization. Urgent Health challenges for the next decade. available from: <https://www.who.int/news-room/photo-story/photo-story-detail/urgent-health-challenges-for-the-next-decade>

Methods

Objective:

- To study the impact of a multifaceted QI intervention on influenza vaccination rates across children evaluated at outpatient clinics, urgent care (UC) and emergency departments (ED) at UnityPoint Health tertiary care centers (UPH) in Northwestern (NW) and Northcentral (NC) Iowa (IA), United States



Study Design

- Inclusion criteria: All Patients aged 6 months-18 years evaluated at UPH were included.
- Study sites: Performed at: UPH in NW and NC IA (at Sioux City, Sergeant Bluff and Fort Dodge encompassing 5 outpatient clinics, 2 UC, 2 ED)
- Study Period: 2017-18 (labeled P1) and 2018-19 (labeled P2) influenza seasons

Methods

QI Intervention:

A multifaceted QI intervention was implemented on 9/1/2018 consisting of all of the following concomitantly:

- 1. Patient/family education: Posters about flu vaccination displayed at entrance, in waiting rooms and patient rooms throughout the clinics, UC, ED as well as patient/family handouts emphasizing importance of influenza immunization.
- 2. Information Technology: "Health maintenance" reminder in outpatient electronic medical record (EMR- EPIC) that appears as soon as a patient's chart is accessed to remind nurses/providers that influenza vaccine is due.
- 3. Provider Education flyers at study sites about debunking flu myths.



Graphic showing Components of QI Intervention: EMR reminder and representative posters, patient/family education handouts, provider education flyers used in the study

(sources: CDC and Iowa Department of Public Health resources for providers, UnityPoint Health)

Pre-intervention period (P1, 09/01/2017– 05/31/2018) was compared with intervention period (P2, 09/01/2018 – 05/31/2019) for influenza vaccination rates[#]

[#]Statistical comparisons with chi-square (χ^2) or Fisher exact tests; $p < 0.05$ considered significant

Results

A total of 10050 and 9889 patients were evaluated during P1 and P2 respectively

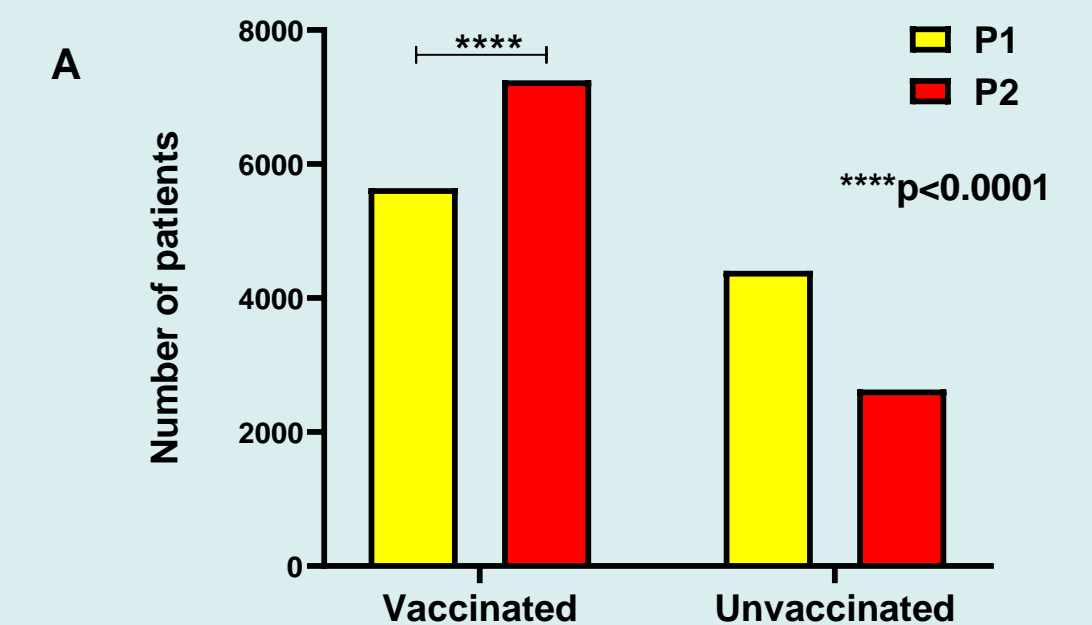
Influenza vaccination rate increased significantly from 56.1% (5642) in P1 to 73.3% (7252) in P2 ($p < 0.0001$)

Patients were 1.43 times more likely to get vaccinated during P2 than P1 (95% CI= 1.32-1.46)

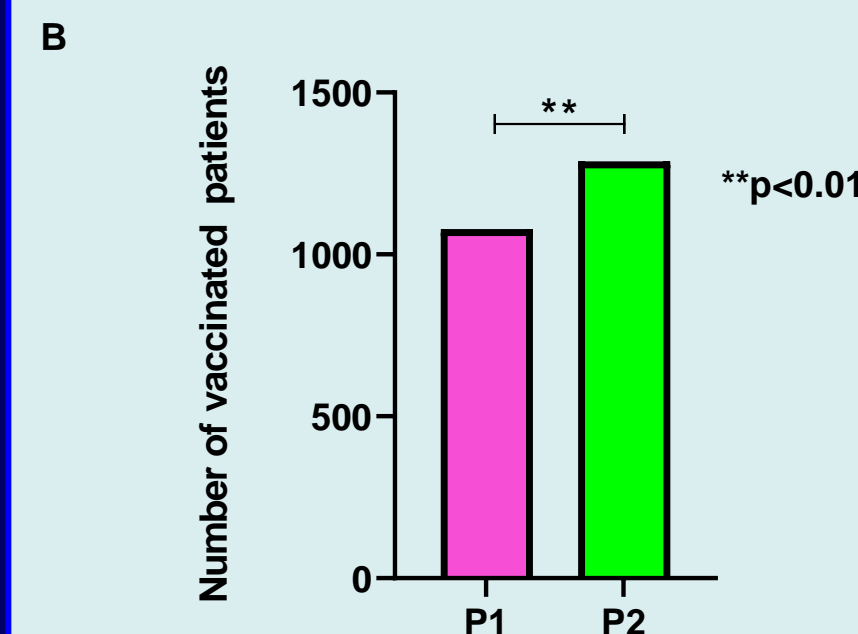
47.2% (1287/2723) of <3y olds vaccinated in P2 Vs. 40% (1078/2671) in P1 [$p < 0.01$].

Proportion of children receiving second dose increased in P2 [43% (2436) to 69% (4975) ($p < 0.001$)].

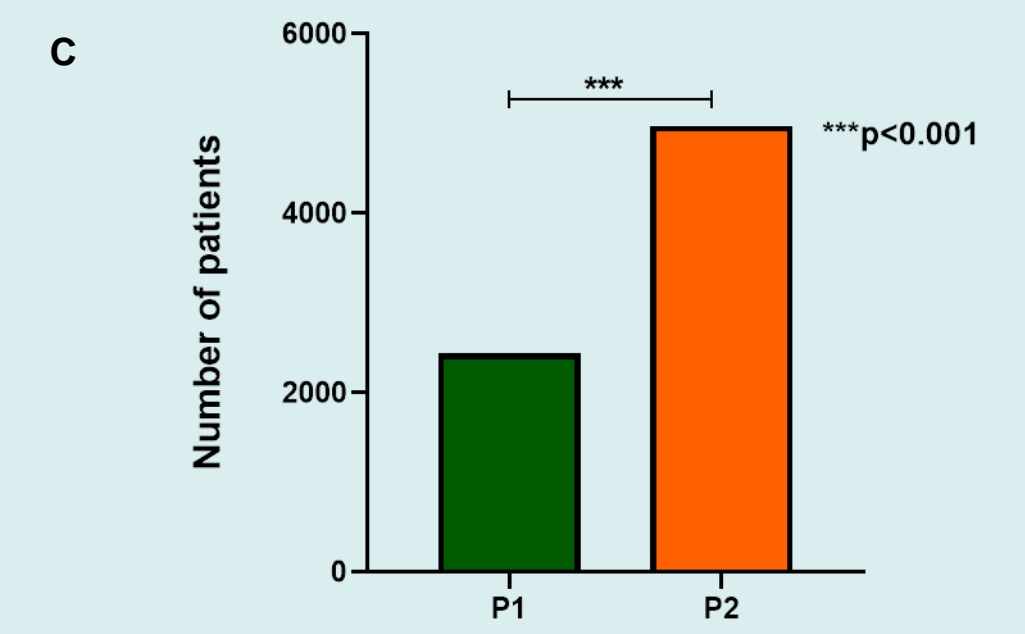
Flu Vaccination Rates Significantly Higher in P2



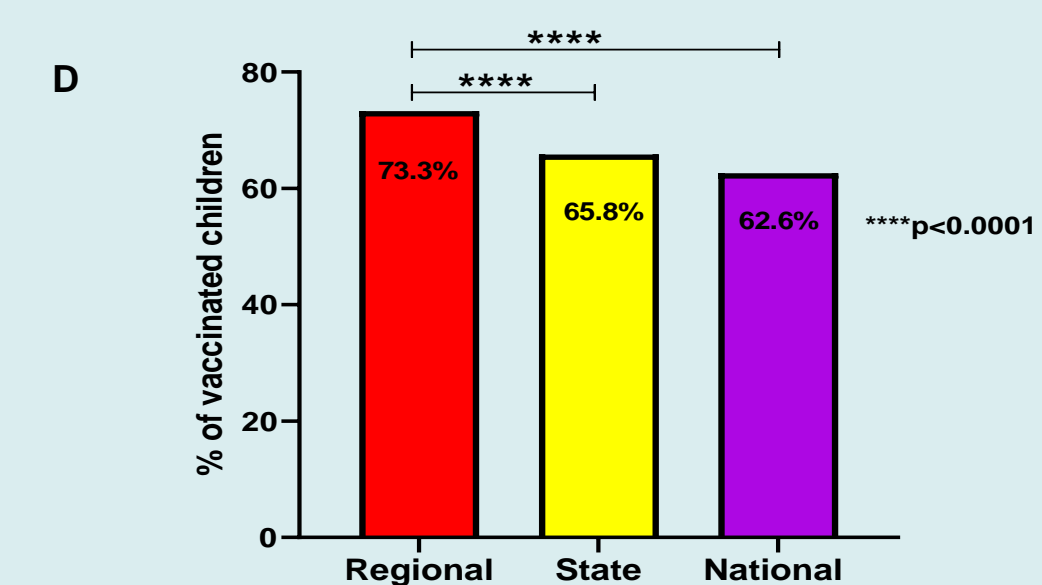
Significantly Higher Flu Vaccination Rate in 6-36 mo. Age Group during P2



More children (<9 y) received 2nd dose of Flu vaccine during P2



Regional Flu vaccination rates higher in 2018-19 (P2) than National and State averages



Discussion/Conclusions/Next Steps

- This is one of the few studies reporting strategies for promoting influenza vaccination in children in the United States and the first study assessing interventions for improving pediatric influenza vaccination rates in the Midwest.
- Our results indicate that with the combined educational and technologic intervention, the rates of pediatric influenza vaccination across Northcentral and Northwestern Iowa increased significantly from 2017-18 to 2018-19 seasons, including children 6-36 months of age; and the proportion of patients receiving second dose of the influenza vaccine.
- Regionally, pediatric influenza vaccination rates were higher than the National as well as Iowa State average rates.
- Next steps would be to study the impact of increased influenza vaccination coverage on decreasing influenza disease burden in terms of reduced flu related ER visits/hospitalizations/mortality.