

Feasibility of a Novel Combination of Influenza Vaccinations and Child Passenger Safety Seat Fittings in a Drive-through Clinic Setting

Ngoc Le, MD; Rachel L. Charney, MD; James Gerard, MD

ABSTRACT

Objective: Public health preparedness is an ever-evolving area of medicine with the purpose of helping the masses quickly and efficiently. The drive-through clinic (DTC) model allows the distribution of supplies or services while participants remain in their cars. Influenza vaccination is the most common form of DTC and has been utilized successfully in metropolitan areas.

Methods: We hypothesized that combining influenza vaccinations and child passenger seat fittings in a DTC format would be both feasible and desired by the community. Each driver was verbally surveyed at each DTC station. The project was a combination of patient survey and observation.

Results: In the inaugural 6-hour DTC session, 86 cars were served and contained 161 children, of which 28 also participated in child passenger seat fittings. The median total clinic time regardless of services rendered was 9.0 minutes (interquartile range [IQR]: 6.0, 14.0 minutes). For those who received only an influenza vaccine, the median total time was 7.5 minutes (IQR: 6.0, 10.0 minutes). For those who received both services, the median total time was 27 minutes (IQR: 22.3, 33.5 minutes) with an average of 1.75 child passenger seat fittings per automobile.

Conclusion: This was a pilot study involving 2 different services using the DTC model and the first of its kind in the literature. The DTC was successful in executing both services without sacrificing speed, convenience, or patient satisfaction. Additional studies are needed to further evaluate the efficacy of the multiple-service DTC model. (*Disaster Med Public Health Preparedness*. 2017;11:647-651)

Key Words: influenza vaccines, public health, safety management, community health planning, emergency preparedness

The Centers for Disease Control and Prevention (CDC) endorses influenza vaccination for all persons older than 6 months.¹ In the past 5 years, however, less than 50% of the US population was vaccinated, with an overall drop in the past 10 years. Over the past decade, drive-through clinics (DTCs) containing influenza vaccinations have grown in popularity and have shown success in emergent situations as well as being an appropriate avenue to efficiently allocate resources.² This model in which participants stay in their cars and drive through to obtain services has proven to be not only fast and efficient but also convenient.³

Car seat safety has also been a recent focus for community intervention.⁴ Motor vehicle injuries are a leading cause of death among children in the United States, but many of these deaths could have been prevented.⁵ In 2014, 602 children aged 12 years and younger died in motor vehicle crashes and over 121,350 children were injured.⁶ Even though multiple child restraint systems are available, they are often used incorrectly or improperly. A previous study

showed that 72% of car boosters or seats were misused in a way that would increase the risk of injury or death.⁷ This was most prevalent with school-aged children.⁷ Even with the improved awareness and research proving that car seat usage decreases deaths to infants by 71% and death to toddlers by 54%, approximately 33% of children who died in automobile accidents were not in appropriate car boosters or seats or fitted properly.⁴ Of the children who died, an overwhelming majority were of either African American or Hispanic background.⁶ In a year, more than 618,000 children between the ages of 0 and 12 years rode in cars without using child safety seats.⁶ Of those children who died in car crashes in 2014, 34% were not restrained.⁶

According to reports on influenza DTCs conducted across the nation, there has been significant satisfaction among providers and participants.² One unexplored possibility is combining a variety of services in a DTC. We therefore hypothesized that combining influenza vaccination and child passenger seat fittings in a DTC format would be both feasible

and desired by the community. This study was conducted in an urban Midwest city with a population of approximately 300,000. The predominant ethnic groups were Caucasian and African American, each of which represent about 45% of the city's population. The median household income was approximately \$35,000, with 27% of the population living below the poverty line.⁸ Traveling within or owning a car was not a requirement for participation in the DTC; however, it was a criterion to be a part of this study. The goal was to explore the feasibility of automobiles participating in the DTC providing influenza vaccinations and child passenger seat fittings at no cost.

METHODS

Population and Location

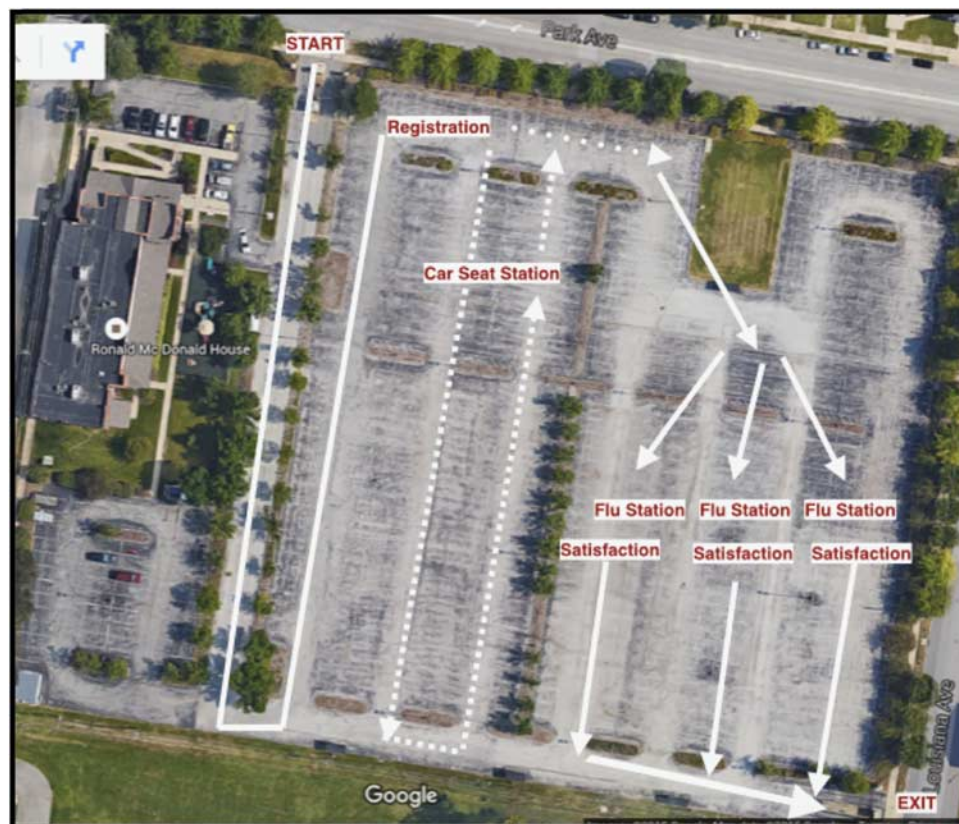
The combined-service DTC was on Saturday, October 10, 2015, from 0900 to 1500 at a local parking lot where only those in cars with children who were 18 years of age or younger were eligible for the study. Participants had the opportunity to either receive an influenza vaccination, child passenger seat fitting, or both services. Participants had to be physically within a vehicle.

The DTC was conducted in a large open parking lot to allow for safe car flow (Figure 1). From the start of registration, vehicles were identified with a randomly selected number that was assigned for anonymous identification. They were then directed toward the child passenger seat fitting station. If the automobile chose to participate in the child passenger seat fitting, a certified specialist approached the car to conduct the inspection. If the child was found not physically in a car seat, one was provided free of charge in addition to the fitting. After this station, the vehicles proceed to the influenza station where they rolled down the car window to momentarily get the age-appropriate influenza vaccine. If the automobile chose initially not to participate in the child passenger seat fitting, it would advance directly to the influenza station.

At all the stations, the subjects participated in verbally administered surveys specifically focused on satisfaction levels and previous DTC experiences. Because of how the surveys were conducted, only English-speaking participants were included in the survey study; however, anyone who came to the clinic was allowed to participate in the clinic services. Refer to Addenda A through D in the **online data supplement**

FIGURE 1

Arial Overview of the Drive-through Clinic at the Ronald McDonald House Parking Lot.



for a copy of all survey questions. Following this, the automobiles were given clinic documentation for all provided services and exited.

Centers for Disease Control and Prevention Influenza Guidelines

Children aged 6 months or older are recommended to obtain annual influenza vaccination.¹ Those aged 6 months to 2 years are required to get 2 lower-dose influenza vaccinations 1 month apart.

Influenza vaccinations were offered in the DTC for children aged at least 6 months in accordance with the CDC guidelines. According to the recommendations of the American Academy of Pediatrics, it is encouraged that children from ages 6 months to 3 years receive an annual influenza vaccine. Those requiring a second vaccine had their contact information recorded and were then provided with an opportunity to return for a walk-in influenza vaccine follow-up time.

Child Passenger Safety Guidelines

Current state guidelines reflect CDC guidelines that state all infants and toddlers to 2 years should be in rear-facing car seats in the rear passenger seat and not in front of an active air bag. From ages 2 to 5 years, children may graduate to a forward-facing car seat; however, they must continue in the

rear passenger seat. From ages 5 to 12 years, they may be placed in a forward-facing booster seat in the rear passenger seat. Once the child is at least 57 inches in height or can have the seat belt fit properly, they no longer need to use the booster seat and may sit in a front passenger seat with an active air bag.

Data Analysis

Outcome variables were analyzed by using the Statistical Package from the Social Sciences (SPSS) version 23.0 (IBM Corporation, Armonk, NY).

RESULTS

Eighty-six automobiles containing 161 children participated in the 6-hour combination DTC. Of this group, there were 26 child passenger seat fittings (Figure 2). The median total clinic time regardless of services rendered was 9.0 minutes (interquartile range [IQR]: 6.0, 14.0 minutes). Of those who received only the influenza vaccine, the median total clinic time was 7.5 minutes (IQR: 6.0, 10.0 minutes). Of those who received both services, the median total clinic time was 27.0 minutes (IQR: 22.3, 33.5 minutes) (Table 1).

In reflection of the automobile and participant demographics, there was no pattern or predominance with self-reported

FIGURE 2

Population Breakdown of the Drive-through Clinic Participants.

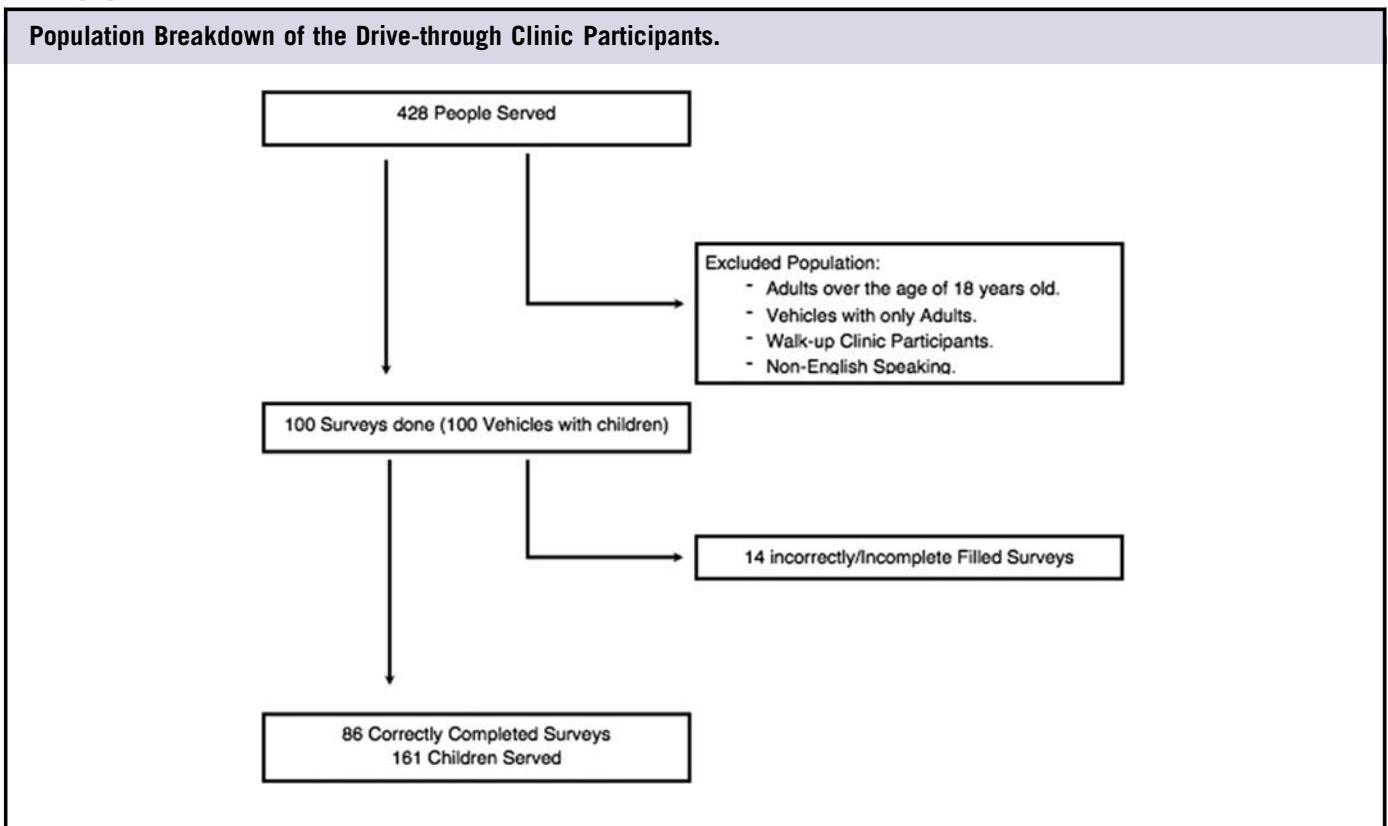


TABLE 1

Average Throughput Clinic Times ^a		
	Average (min)	IQR
Flu shots only	7.50	(6.0, 10.0)
Flu shots + CPSF	27.0	(22.3, 33.5)
Average time overall	9.0	(6.0, 14.0)

^aAverage throughput times of drive-through clinic participants separated by services rendered. Abbreviation: CPSF, child passenger seat fittings; IQR, interquartile range.

FIGURE 3

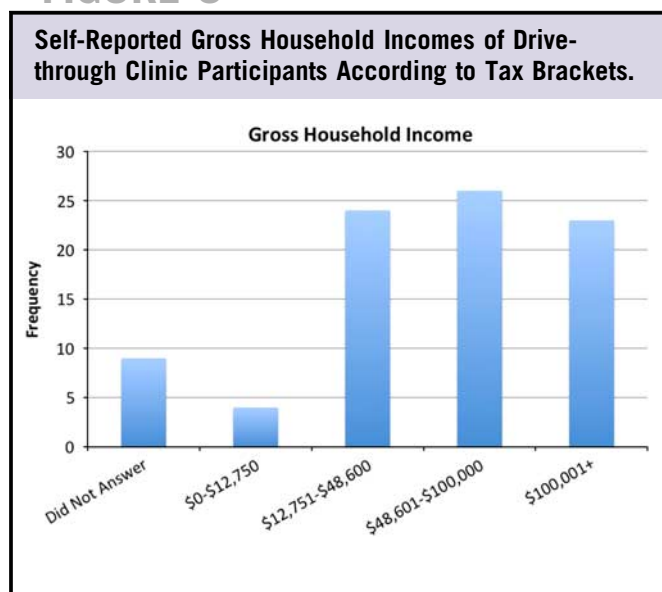
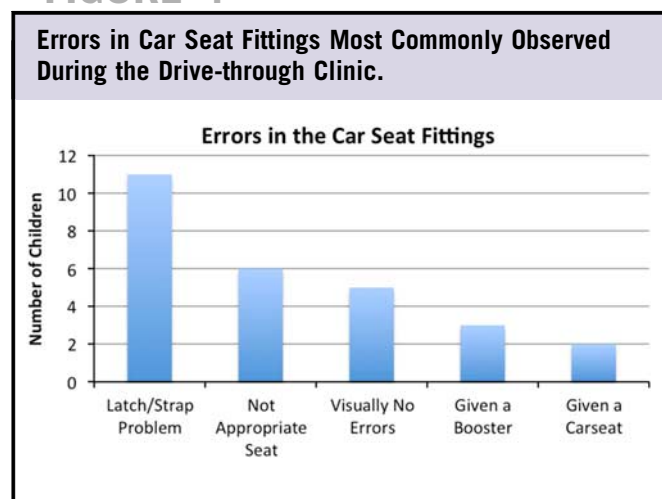


FIGURE 4



gross household income (Figure 3). The 2 genders were equally distributed with an increased prevalence in the age bracket of birth to 10 years and for Caucasian descent. When analyzing the child passenger seat fittings, the most common issue seen involved the latches and straps of the

seat. The other common issues were that the car seat was expired, the car seat had been previously damaged, or the child was not in an appropriately sized seat or booster (Figure 4). All participating automobiles in this station felt that the combination DTC was a valuable service to the community and that they were better educated on the topic.

Surveyed participants identified the DTC components (eg, registration, flu vaccination, car seat fitting, car flow, overall satisfaction, and staff/personnel) with ratings of satisfied, somewhat satisfied, neutral, somewhat dissatisfied, and dissatisfied. Approximately 90% of surveyed attendees stated that they would participate in another DTC; 85% (n = 73) had never previously done so. The most prominent strengths were “speed and convenience,” noted in 80% (n = 69) of responses. The most noted weakness was “location” (3.5%; n = 3); however, 89.5% (n = 77) responded that there were “no weaknesses” in their DTC experience.

Last, participants were asked how they were made aware of the DTC. The most popular responses were “media, radio, television, and Internet” at 37.2% (n = 60) and “friend or family” at 34.9% (n = 56).

DISCUSSION

The combined-service DTC was found to be both feasible and desired by the community. This pilot study was successful in integrating both services while maintaining a high level of patient satisfaction. A caveat of this statement is that even though both services were available, only 16.1% of the attendees participated in both.

A smaller attendance was noted compared with previous years with the single-station influenza DTC; therefore, the combined-station DTC was not fully tested to firmly establish the feasibility and efficacy with higher volumes of participants. The DTC was advertised alongside 5 other free “traditional” influenza vaccination clinics located at other local hospitals. Shared media attention with these other clinics may have adversely affected attendance at our DTC. We hope that future combined DTCs will get more clinic-specific publicity to help increase community participation.

There was no significant correlation of who participated in car seat fittings in reference to the number of children in each automobile or the gross household income. It was also noticed that many automobiles bypassed this station for reasons that were not explored.

One of the strongest characteristics of the study was the clinic layout. Even with 3 responses of “neutral” satisfaction toward traffic flow, there were no occurrences where an automobile strayed away, incorrectly followed the intended path, or

experienced an extensive automobile line. After passing the registration station, flow rarely was more than a 3-car succession.

Another unanticipated occurrence was that 2 participants, after going through the entire DTC and realizing how fast and efficient it was, returned with a car of different children. After reviewing the results of the survey because the drivers returned with different children, they were included in the study as separate participants.

In the future, a few things would improve this DTC. It would be better if this DTC had more diverse and unshared publicity including Internet, local newspapers, radio, and primary care clinics. In the future, if resources are not limited, it would be beneficial to extend the DTC to a full weekend (Saturday and Sunday). Last, one restriction that applies to all DTCs is that a large space is required to accommodate multiple automobiles to ensure safe traffic. The current location is prime for this; however, it is not easily visible from major intersections and streets. In the future, exploring the possibility of a more visible location may improve participation.

CONCLUSION

The first pilot study of combining multiple services in the DTC model was an overall success; however, higher-volume future multi-service DTCs and additional studies need to be done to fully evaluate the feasibility of this modified model. Our preliminary results not only showed that 2 services can be accomplished but also inferred that more services can be integrated without sacrificing quality and efficiency of care. Nonetheless, the combined-service DTC was feasible and desired by the community.

About the Authors

St. Louis University/SSM Cardinal Glennon Children's Hospital, Pediatrics, Saint Louis, Missouri; Drs Le, Charney, and Gerard).

Correspondence and reprint requests to Ngoc Le, St. Louis University/SSM Cardinal Glennon Children's Hospital, Pediatrics, Saint Louis, MO, 63104 (e-mail: ngocanhle@slu.edu).

Supplementary material

To view supplementary material for this article, please visit <https://doi.org/10.1017/dmp.2017.3>

Published online: May 2, 2017.

REFERENCES

1. Centers for Disease Control and Prevention. Seasonal influenza: flu basics. CDC website. <http://www.cdc.gov/flu/about/disease/index.htm>. Accessed February 23, 2015.
2. Burger T, Fry D. Drive-through flu clinic meets high expectations. *Pennsylvania Nurse*. 2007;62(4):25-26.
3. Carrico RM. Drive-thru influenza immunization: fifteen years of experience. *J Emerg Manag*. 2012;10(3):228-232.
4. Turner C, McClure R, Nixon J, et al. Community-based programs to promote car seat restraints in children 0-16 years – a systematic review. *Accid Anal Prev*. 2005;37(1):77-83.
5. Centers for Disease Control and Prevention. Child Passenger Safety. CDC website. <http://www.cdc.gov/MotorVehicleSafety.html>. Accessed November 5, 2016.
6. Centers for Disease Control and Prevention. Child Passenger Safety: Get the Facts. CDC website. http://www.cdc.gov/MotorVehicleSafety/Child_Passenger_Safety/CPS-Factsheet.html. Accessed June 24, 2015.
7. Weaver NL, Brixey SN, Williams J, et al. Promoting correct car seat use in parents of young children: challenges, recommendations, and implications for health communication. *Health Promot Pract*. 2013;14(2):301-307.
8. US Census Bureau. St. Louis City QuickFacts. <http://quickfacts.census.gov/qfd/states/29/29510.html>. Accessed June 24, 2015.