

# Vaccine Ambassadors: An Educational Model to Spread Awareness About Vaccines in Detroit



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## ABSTRACT

Following the COVID-19 pandemic, vaccines against the virus and its various variants (delta, omicron) have been developed. However, Detroit has a vaccination rate of 46.0%, which is below the national average. Important factors that play into this are misinformation, which has propelled a fear of the unknown among patients. **Project aims:** The Vaccine Ambassador Program assessed the effectiveness of conducting and implementing youths as agents of change for communities throughout Detroit. **Design:** The Vaccine Ambassador Program was implemented with highly motivated youth population, who received a detailed education session on the history of vaccines, how vaccines work, why vaccines work, and the beneficial outcomes of achieving herd immunity. These young students aimed to spread this knowledge and education in various communities throughout Detroit, such as schools, community events, outreach events, and many more. **Results:** Eleven high school students participated in the Vaccine Ambassador program and received highly detailed knowledge on vaccines and their effectiveness at preventing disease at the molecular level. They were also educated on the history of medical practices in America that negatively affected African Americans disproportionately; an example of such a practice was the Tuskegee experiments. At the end of the educational program, a survey of the students confirmed that all eleven students enhanced their knowledge of vaccines and their history. More specifically, the participants indicated that they gained a stronger understanding of basic immunology, epidemiology, different types of vaccines, risks of vaccines, and herd immunity. **Conclusion:** Participation in the Vaccine Ambassador program enhanced the students' knowledge on vaccines greatly. This program aims to utilize the power of the student ambassadors' knowledge to educate the public at various schools, communities, and outreach events. The goal of this endeavor is to address misinformation surrounding vaccines and improve vaccination rates in Detroit.

## INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has revealed health disparities, weakening healthcare infrastructures, and severe communication gaps. Moreover, it has exhibited the impact the past and present have on society's perception of the healthcare system. Despite the widespread availability of a COVID-19 vaccine, Michigan and its counties have not reached herd immunity. Detroit only has a COVID-19 vaccination rate of 46.0% since the beginning of the pandemic.<sup>1</sup> Key factors for these low rates are misinformation and fear of the unknown. Notably, social media has become the main source of distributed information, given that it is readily available and easily consumed.<sup>2</sup> Unfortunately, this has led to a pandemic of misinformation and fear. There is also a significant mistrust in the medical field due to past instances of involuntary experimentation of minorities.<sup>2</sup> To improve vaccination rates and overall health, there needs to be a movement towards community involvement and education in vaccines.

Key members of the community that are often overlooked as agents of change are the youth. Their connections and networking are indeed limited. However, there has been a notable amount of policy, environmental, and system changes enacted by youth advocacy.<sup>3</sup> In fact, research has shown that they are instrumental in community and youth development.<sup>3</sup> They have a unique position in the community where they are intimately involved in the interworking of the neighborhood and its culture. Through their enthusiasm, creativity, and energy, they provide a different perspective that is absent from current policy. Involving them simultaneously improves the community's health while paving a future for a new generation of leadership.<sup>3</sup>

Accordingly, the Vaccine Ambassador program involves the empowerment and teaching of youth who in turn will educate their peers. Past research has shown peer education as an effective tool to increase competency and enact behavior change.<sup>4</sup> A significant factor contributing to its success is the demographic similarity amongst the instructor and the audience.<sup>4</sup> This enables effective dissemination of material and a built-in trust between the parties. A study done by Cai et al. also showed longevity to the behavioral interventions taught by the peers.<sup>5</sup> Effectively, it molds the future generations to be civic-minded and knowledgeable about vaccine importance while simultaneously increasing vaccination rates.



Figure 1. Map depicting the geographic diversity of the Vaccine Ambassador participants across the nation (top left) and metro-Detroit, Michigan (right)



## METHODS

### Participants

Vaccine Ambassadors consist of 11 high school students. Of the 11 Ambassadors, 5 identify as "male" (45.4%), and 6 identify as "female" (54.5%). One student is in the 10th grade (9.1%), seven students are in 11th grade (63.6%), and three students are in 12th grade (27.3%). The majority of students—eight students—are ages 15-16 (72.7%) while three students are ages 17-18 (27.3%). Five students identify as "Asian" (45.5%), three students identify as "African American" (27.3%), and three students identify as "Other" (27.3%). Each student comes from a different zip code with ten students from Michigan (90.9%) and one student from Washington (9.1%) (Figure 1).

### Measures

Vaccine Ambassador participants were given two surveys—a pre-survey and a post-survey. The pre-survey asked 47 questions in total. The post-survey consisted of 44 questions. Six questions on the pre-survey asked about demographic information including name, grade level, age, gender, ethnicity, and zip code. Four questions on the pre-survey asked about the participants' current vaccination status to the flu shot, the COVID-19 vaccine, and the state of Michigan's recommended vaccines. Five questions on the post-survey asked about demographic information including name (to match pre- and post-survey responses), age, gender, ethnicity, and zip code. Two questions on the post-survey asked about participants' attitudes towards the summer workshop.

On both the pre- and post-survey, six questions inquired about participants' attitudes towards vaccines and COVID-19. Thirty-one questions on both the pre- and post-survey gauged participants' level of knowledge regarding vaccinations and immunity. These knowledge-based questions were adapted based on recommendations from a study by Kumari et al.<sup>6</sup> All attitude and knowledge questions were measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The survey results were analyzed by comparing the mean response of the group for the pre-survey to the group's mean response from the post-survey.<sup>7</sup> Additionally, individual surveys were analyzed to determine the number of individuals who responded more agreeable, less agreeable, or the same to each question.

### Curriculum

The training period involved 3 weeks of instruction from four WSU SOM second-year medical students. Each week focused on two to three topics. Accordingly, week one focused upon the history of vaccines, the immunology behind them, and the type of vaccines. Week two highlighted the administration/side effects of vaccines and herd immunity. Week three discussed the myths of vaccination, the aspect of false news, and different teaching techniques. Each topic was reinforced through group discussion and post-lecture questions. Once completing the training, the students exhibited what they learned by creating their own teaching materials. They were also taught teaching etiquette and understanding one's audience by the Dean of Communication at Wayne State University.

## RESULTS

### Vaccination Status

Four questions measured students' current vaccination compliance with the annual flu shot, the COVID-19 vaccine, and the State of Michigan's recommended vaccines. Eleven students (100.0%) report being up to date with the State of Michigan's recommended vaccines. Ten participants (90.9%) receive the annual flu shot each year. One respondent (9.1%) is "unsure" if he/she receives the annual flu shot each year. Eleven respondents (100.0%) report having received the COVID-19 vaccine. Finally, eight Vaccine Ambassadors (72.7%) have received the COVID-19 booster shot while three Ambassadors (27.3%) have not received the COVID-19 booster.

### Attitudes Towards Vaccines and COVID-19

Six items measured participants' attitudes towards vaccines and COVID-19. This was measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The following prompt is an example:

#### Vaccine education is important and needs to be offered to individuals of all ages

Pre-Survey: M = 4.73, SD = 0.65; Post-Survey: M = 4.82, SD = 0.40. Compared to the pre-survey, two participants (18.2%) indicated a more agreeable response. One participant (9.1%) indicated a less agreeable response. Eight participants (72.7%) indicated the same response.

### Knowledge Surrounding Vaccines and Immunity

Thirty-one items measured participants' knowledge surrounding vaccines and immunity. This was measured on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The following prompt is an example:

#### Inactive vaccines create a better immune response than live vaccines.

Pre-Survey: M = 2.90, SD = 0.57; Post-Survey: M = 2.27, SD = 0.65. Compared to the pre-survey, one participant (9.1%) indicated a more agreeable response. Six participants (54.5%) indicated a less agreeable response. Four participants (36.4%) indicated the same response.

Refer to **Table 1** for the full list of attitude and knowledge questions and how the average responses compared between pre- and post-survey.

### Attitudes Towards the Summer Workshop

Two questions assessed the student's perceptions of the summer education workshop that was provided to them. Eleven of the participants (100.0%) reported that the summer educational workshop helped them better understand vaccines. Seven of the eleven students (63.6%) reported that the educational workshop changed their perception on all vaccines.

## DISCUSSION

- The Vaccine Ambassadors program **reaffirmed the student's beliefs** towards COVID-19 and vaccination
  - All students are high achievers who are involved in many STEM-related organizations and volunteered to participate in this program due to their academic drive and passion for vaccines
  - All the students responded "agree" or "strongly" agree to the question regarding the importance of vaccine education
- The participants gained a stronger understanding of both **basic epidemiology** and **immunology**
  - The students were better able to identify features of the different types of vaccines, as five or six of the students indicated a response that was more agreeable with the correct answer in three of the questions related to vaccine basics
  - The students developed a stronger understanding of herd immunity as four of the students indicated a more agreeable response to this question
- Therefore, the Vaccine Ambassadors program was able to **achieve the desired knowledge and attitude impact** on the participating students
  - All eleven participants indicated the curriculum helped them to better understand vaccines
  - Seven of eleven students indicated the program changed their perspective on vaccines in general
- The **next step** of this program is for the student ambassadors to utilize their knowledge at various classroom, after-school, and community-based events within their respective communities
  - The **goal of these outreach** events is to teach their peers and community members on the benefits of vaccination, dissuade fear and misinformation surrounding vaccines, and ultimately help improve the vaccination hesitancy present within the metro-Detroit area

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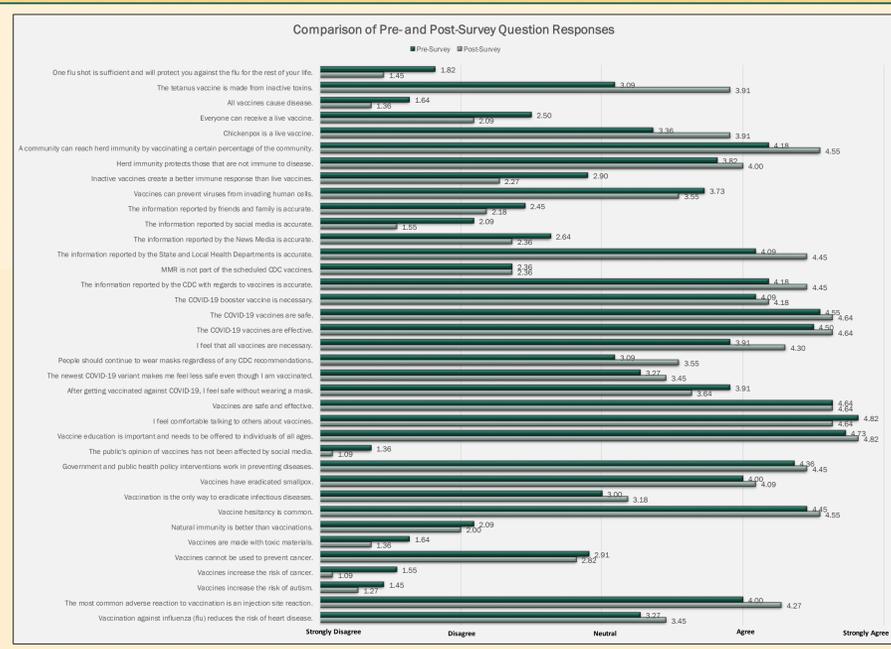


Table 1. Comparison of pre- and post-survey responses

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