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Medical students rise to the COVID-19 vaccine challenge

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Abstract

Background

The COVID-19 pandemic disrupted medical students' education at a time when they were most eager to step up and help with the pandemic response. Indiana University School of Medicine (IUSM) leveraged an existing relationship with the Indiana Department of Health (IDOH) and the major healthcare systems in the state to assist with the state's mass vaccination campaign. In this paper, we describe the development and implementation of a medical student volunteer program, and we highlight the main components of establishing community service programs that allow student involvement in public health initiatives.

Methods

IUSM appointed a taskforce to create a state-wide IUSM Medical Student Volunteer Vaccinator program to quickly train and deploy a medical student volunteer workforce. This taskforce was charged with (1) creating and delivering asynchronous and in-person training curriculum for all nine regional campuses and (2) coordinating medical student volunteerism for vaccine delivery across the state of Indiana.

Results

A total of 517 of 739 targeted medical students were fully trained in vaccine administration and contributed to over 2,000 hours of volunteer community service and delivered over 15,000 vaccine doses across the state of Indiana. Students also participated in other essential vaccination delivery roles, such as screening and registration of patients, exit monitoring, and pre-calling patients to remind them of their appointments.

Conclusions

Community service should be a critical component of medical student education. The IUSM Medical Student Volunteer Vaccinator program is an example of what the collaboration between medical schools, state health departments, and healthcare systems can achieve. This model can not only be disseminated to other medical school/healthcare system dyads for mass vaccination efforts but can also be expanded to other public health initiatives such as health screening programs, health education programs, contact tracing programs, community outreach programs, and global health initiatives.

Background

The COVID-19 pandemic disrupted health care delivery and consequently medical student education. Students had lost some opportunities to participate in clinical care due to safety and resource utilization concerns, despite being driven to rise to the challenge and help.[1] Due to initial concerns about personal protective equipment (PPE) shortages and the high

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community spread of the virus, the Association of American Medical Colleges (AAMC) recommended pausing all clinical education for medical students in March 2020.[2] Concomitantly, COVID-19 created a significant need for healthcare delivery, as the healthcare workforce experienced frequent COVID-19 surges and staff shortages.

The Indiana University School of Medicine (IUSM) leadership partnered with the Indiana Department of Health (IDOH) early in the pandemic to develop community service initiatives for medical students to support healthcare in Indiana.

Community engagement is increasingly being recognized as an essential component of medical student education, as a means to understand the US healthcare system and address healthcare disparities.[3] To increase the number of Indiana healthcare providers to meet the first wave of COVID-19, IUSM created an early graduation program for senior medical students to assist in staffing local hospitals granted disaster privileges by the state.

The fall of 2020 brought yet another challenge, the administration of COVID-19 vaccinations, with almost all licensed healthcare providers needed at the bedside. Longitudinal clinical experiences for medical students were still suspended, and students were eager for opportunities to assist in the pandemic response. IDOH and IUSM leadership quickly identified a win-win opportunity. Trained medical student volunteers could administer COVID-19 vaccinations, which provided them the opportunity to interact with patients in a clinical setting and simultaneously contribute meaningfully to the fight against COVID-19. In this paper, we describe the development and implementation of the IUSM Medical Student Volunteer Vaccinator program, and we highlight the steps for establishing community service programs that allow student involvement in public health initiatives.

Methods

Needs assessment and strategic planning with IDOH

IUSM, being the largest allopathic medical school in the country, spanning nine campuses throughout the state, was well-positioned to assist IDOH with the mass vaccination campaign. In November 2020, IUSM appointed a taskforce to create an IUSM Medical Student Volunteer Vaccinator program. This taskforce was charged with quickly and efficiently creating and delivering a preparatory curriculum and coordinating medical student volunteerism across the state.

Needs assessment with the health systems and local health departments around the state

It was crucial for the success of the program to identify the staffing needs of the health systems and the local health department's vaccine points of distribution (POD) around the state. The taskforce held meetings with the major healthcare systems in the nine counties where IUSM Medical School campuses are located, as well as with other healthcare systems that reached out for assistance with their vaccination programs. These meetings clarified the staffing needs of vaccination sites and helped set expectations for medical students in this initiative, including defining the level of supervision needed for them on-site, and articulating logistics of operations.

Call for volunteers

The focus of recruiting volunteers was on students in the first two years of medical school, due to their increased availability compared to the third- and fourth-year medical students, who were already engaged in required clinical education. An initial student communication was sent to these students before Thanksgiving 2020 as an advanced notice about an opportunity to be trained and volunteer to deliver vaccines. Once the volunteer training program was ready, students were sent a follow up email to allow them to sign up for the training, and the email directed to IUSM's learning management system (LMS) that housed the required training modules.

Curriculum development

The taskforce convened a subcommittee with leaders from Infectious Disease, Office of Medical Student Education, and Simulation Center to develop a two-part training curriculum for medical students. All student volunteers were required to complete both asynchronous online modules and in-person module to become certified to deliver intramuscular injections and to volunteer in clinics. The asynchronous online module included an instructional video on the technique of intramuscular injections and safety procedures, information on

the specific vaccines being administered, proper PPE use, possible complications, and needle-stick injury reporting process. In-person training involved simulated intramuscular injection practice and a competency check-off by a registered nurse or physician. Completion of both the online and the in-person modules was documented electronically. Once verified, students were granted access to the IDOH vaccine electronic medical record and given approval to proceed with supervised delivery of intramuscular injections.

1. **Asynchronous Training**

The asynchronous training was delivered using IUSM's LMS. The training site included six required assignments: (1) Introduction Video, developed to inform students of the volunteer need and training required, (2) Centers for Disease Control (CDC) Vaccine Training Presentation, available at https://www2.cdc.gov/vaccines/ed/vaxadmin/va/index.html, (3) Video on How to Administer IM Injections from the American Pharmacy Association (APhA) available at https://www.youtube.com/watch?v=1H7LnK0CpOY&feature=emb_logo, (4) PPE: Face Mask Dos and Don'ts from the CDC, available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/using-ppe.html, (5) Infectious Disease Exposure Information for MD Students, and (6) Acknowledgement of Risks of COVID-19 Vaccination Administration.

2. **In-person training**

In-person vaccine administration training included a practice session and assessment. Trainings were offered at the school's simulation centers in Indianapolis or at regional campuses. To simulate vaccination administration, students practiced drawing 1mL saline from 30mL bottles with a 21g needle and 3mL syringe. Next, they prepped an IM injection pad surface with alcohol and injected the saline. Students were allowed up to 30 minutes of practice while watching the APhA video. The final assessment check-off was completed by a nurse or physician who witnessed the students perform the entire procedure.

Volunteer Vaccine Administration and Data Collection

The involvement of multiple healthcare systems made it difficult to standardize a single shift sign-up system for all medical students throughout the state. Instead, the LMS was used as an online portal to present students with opportunities available at different sites, and included the sign-up protocol/link used at each site. It was crucial to establish a separate and distinct sign-up protocol for medical students versus other volunteers/employees due to supervision needs for the students, and wherever possible, to accommodate shorter shifts, and minimize friction with their competing curricular schedules. Once students completed their training, the LMS site provided all relevant information about volunteer expectations, signing up to volunteer at a vaccine clinic, and reporting volunteer activities.

An online, self-reporting, data collection system was created with the largest IUSM health system collaborator, IU Health, to collect data on the students' contributions to the vaccination effort, and to monitor trends and needs over time in the different volunteer locations. Students signed in after each shift and logged the location, hours of volunteer work, and an estimate of the number of vaccine injections given per shift.

Communications

After the initial campaign to recruit students, additional communications were sent when new opportunities arose, including a volunteer opportunity at COVID vaccine clinics at the Indianapolis Motor Speedway during May 2021, in conjunction with the Indianapolis 500, and at the Indiana State Fair in August 2021. Ongoing progress of the program was shared with the taskforce and leadership at IUSM and IDOH. Periodic reports of student activity and impact on vaccine distribution were provided to the IUSM community. The Indiana news media reported on students' involvement as did national outlets such as Reuters, Bloomberg News, and the AAMC.

Dissemination of the curriculum

There was early and intense interest in the program both locally and regionally. The Physician Assistant School at IUSM expressed interest in joining the vaccinator workforce. The program

curriculum and online systems were immediately shared with this group. As the IUSM program attracted the attention of the media, several other academic health institutions outside of the state of Indiana reached out to inquire about our process and curricular model.

Premedical student volunteer program

The IUSM-Bloomington campus, which is collocated with the largest Indiana University residential campus, experienced a similar student-centered desire to help amongst undergraduate students. A three-credit-hour COVID-19 Vaccination Volunteerism service-learning course was offered to baccalaureate students. In addition to volunteering in nonskilled roles such as registration, these students read articles on COVID-19, the science behind vaccination, vaccine hesitancy, and diversity/equity/inclusion issues associated with COVID-19 and vaccination. Students logged their volunteer hours and completed a weekly journal entry on a specified prompt. Some of these journals were included in the Indiana University Library project "The Coronavirus Days" (https://libraries.indiana.edu/coronavirus-days-archive-story).

Results

A total of 517 out of 739 targeted medical students completed the training program across the nine IUSM campuses. Between December 2020 and June 2021, medical students logged 2,216 volunteer hours and 15,088 intramuscular injections. Student roles in these clinics were not restricted to intramuscular injection delivery; they were mobilized within the clinics to participate in other roles where an area of need arose, such as screening and registration of patients, exit monitoring, and pre-calling patients to remind them of their appointments. The rate of participation of students peaked during the time of highest COVID-19 vaccine demand around the state and dropped off as demand for the vaccine subsided. This drop-off also coincided with the time students were graduating or transitioning between curricular phases (Fig 1).

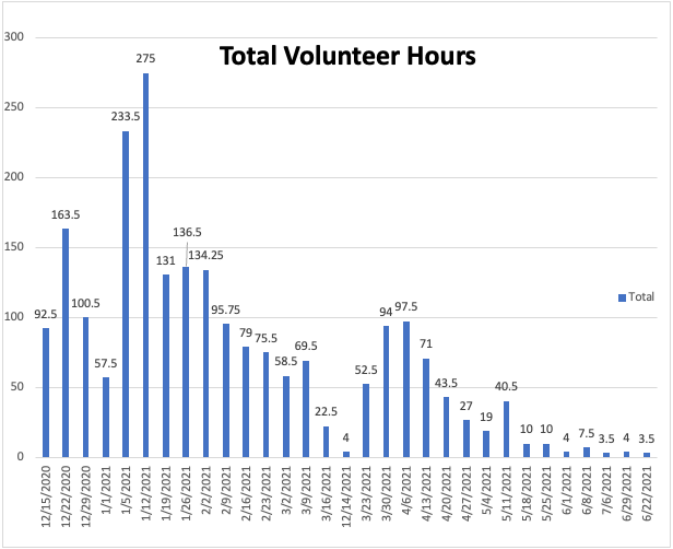

Figure 1. Number of volunteer hours over time.

As for the undergraduate program, a total of 45 students completed the course, logging a total of 2,789 hours in vaccination clinics around the state. At the end of the semester, many of these students were able to work in the community vaccination clinics for summer employment.

Public communications garnered strong interest. Social media posts about student vaccination efforts averaged an 8.15% engagement rate, with one outlier post on the partnership with the State of Indiana reaching an astounding engagement rate of nearly 61%, showing that our followers strongly cared about this story. According to social media management company Hootsuite, most social media marketing experts agree that a good engagement rate is between 1% to 5%.

Discussion

The COVID-19 pandemic is a major public health event and simultaneously, one of the first exposures of the medical student class of 2025 to clinical practice. Despite not representing core clinical education, community service has proven to be a critical component in the education of medical students.[3,4] According to a national survey, most medical students did not feel that the current medical school curricula adequately addressed their knowledge gaps of the US healthcare system.[4] The COVID-19 pandemic has not only exposed a deficiency in global and local public health preparedness, but also uncovered the incredible agility of human beings in general and medical

students in particular, and their craving to help and do good. It is prudent to capitalize on the progress made so far.

For our medical students, the opportunities to participate in community service were well-received and beneficial in terms of educational as well as societal gains. This experience was the first opportunity many phase-1 students had in patient care, as the pre-clinical curriculum is more focused on developing knowledge, exam skills, and decision-making. The IUSM Medical Student Volunteer Vaccinator program was an excellent example of what the collaboration between medical schools, state health departments, and healthcare systems can achieve. Our model of integrating community engagement education in medical student curricula relied on four essential steps: (1) needs assessment, (2) partnership with community leaders, (3) development of an educational and training curriculum, and (4) maintenance of the volunteer program through continuous feedback. This model can not only be disseminated to other healthcare system/medical school dyads for mass vaccination efforts but can also be expanded to other public health initiatives such as health screening programs, health education programs, contact tracing programs, community outreach programs, and global health initiatives.

One of the potential limitations of these programs is the need to prioritize the core medical school curriculum first. This can be a barrier to inclusion as a consistent component of a community engagement programs. For partnering with healthcare systems and the community, it is crucial to set expectations regarding student availability. In our experience, we found the greatest success and participation levels in counties where healthcare systems accommodated students in their operational plan. Notably, this required extra time and effort on the part of these healthcare systems upfront, but also offered a greater return by fully engaging enthusiastic and dedicated learners in these vaccine clinics. This study adds to the existing literature about the eagerness of the medical students to participate in community service programs, as well as the barriers to this participation as it relates to the time constraints of integrating these curricula into established educational programs.[6,7]

Future implications

To better prepare the future generation of clinicians for understanding and contributing to our healthcare system more effectively, medical school curricula should contain and accommodate a component of community service. Collaboration between medical students, school leaders, healthcare systems, and public health institutions needs to be maintained to assure continuity of volunteer initiatives over time.[5] This model can not only be disseminated to other medical school/healthcare system dyads for mass vaccination efforts but can also be expanded to other public health initiatives such as health screening programs, health education programs, contact tracing programs, community outreach programs, and global health initiatives. While there was a high interest in participation on the part of our students, further studies could explore the reasons for the lack of engagement of those who did not sign up for the training, and dive deeper into the reasons behind the lack of participation of those who received the training in volunteer activities.

Study limitations

One of the limitations of this study include self-reporting nature of the logging system. This may have inaccurately represented the number of hours volunteered or injections delivered and resulted in an underestimation of the students' contribution to this public health response. In addition, some students struggled to find times for volunteering that did not interfere with their core learning, since most clinics were open during weekday business hours, similar to scheduled educational activities. Finally, our findings represent the experience of a single institution and may not be generalizable to other institutions.

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