An Insight on the Arrangement of a Remote Military COVID-19 Vaccination Site

On December 27, 2020 the Israel defense forces medical corps (IDF-MC) launched a coronavirus disease-2019 (COVID-19) vaccination campaign, aiming to vaccinate military personnel. On February 9, 2021 more than 72% of the military personnel have been vaccinated, on top of many who have previously found to be PCR positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). We report on a specific operational issue that enabled us to improve vaccination execution on our vaccination sites while employing only few highly qualified medical personnel per site.

The Pfizer vaccine has been the only type used in the IDF thus far. The vaccine guidelines imposed strict transportation regulations for the vaccine vials and strict time limitation from de-freezing of the vials to expiration. Moreover, the preparation of the vaccine sample at the vaccination site included a few precise steps and demanded responsibility and accuracy. Although the manufacturer primarily guided users to withdraw five vaccine doses from a single vial, accurate work could produce a sixth dose, which was later approved by Pfizer, and represented a 20% increase in the amount of individuals that could be vaccinated using the same product. Consequently, the IDF-MC headquarters instructed that only MDs, DMDs, nurses, and paramedics (EMT-P) were allowed to prepare the vaccination syringes, in order to maximize the number of syringes produced. Medics (EMT-I), which were soldiers that underwent a 12-week course that involved basic trauma support training and clinic work were not allowed to prepare the syringes but only to vaccinate patients. This unique setup, where the person who vaccinated patients was not the one who prepared the dose, was only implemented in the IDF when compared to other civilian medical organizations and required specific safety guarantees.

Army nurses were needed for many army services common during the COVID-19 pandemic, while medics were more widely available for the vaccination campaign. We therefore aimed to increase the application of medics and decrease the utilization of other more qualified medical personnel while keeping high quality at the vaccination sites. We hereby present two models for these vaccination sites, and the one we preferred.

According to the first model (model A, supplementary figure 1) the vaccine preparation station was set at the back-stage of the vaccination site. From this station syringes were transported to the vaccination stations either by the nurse, by the vaccinating medic, or by a third “delivery medic”. At the vaccination stations, the medics questioned the patients and vaccinated them. The main advantage of this setup was that the nurse could focus on the syringes preparation and the risk for mistakes was therefore small. Furthermore, the vaccination stations setup allowed to properly regulate the patient flow. This model incorporated a few significant disadvantages: (1) Control and supervision: the senior medical professional (who prepared the vaccines) could not see the medics vaccinating and could not spot flaws and correct mistakes. (2) Flow: The senior medical professional could not see the waiting line and the patient flow and could not fit his work to the workload ahead. (3) Personnel burnout: the delivery of the syringes from the preparation station to the other stations throughout the day exhausted the medics. (4) Safety: The frequent movement of people between the vaccination stations while holding the vaccine syringes could pose a risk of dropping the syringes and thereby losing valuable vaccine doses.

The second model (model B, supplementary figure 2) presented a change that addressed the disadvantages of the prior model. The vaccination stations were organized in a C shape and the preparation station was set at the heart of the C. This setup incorporated a few advantages: (1) Control and supervision: the senior medical professional could see the medics working and supervise them. (2) Flow: The senior medical professional could see the entire vaccination site and fit their work to the patient flow. (3) Personnel burnout: The delivery of the syringes from the preparation station to the other stations involved merely reaching a hand. (4) Safety: There was no movement with syringes between stations. The patient flow was directed in a shape of a horseshoe that created a complete separation between the vaccine preparation station and the patients and medics, while allowing a constant eye contact between the senior medical professional and all stations, including the waiting room. Human resources personnel and
policemen were set at the vaccination site entrance and made sure that only those who had an appointment were allowed to enter the waiting room. The entrance flow was also regulated in concordance with the vaccination stations in order to avoid a patient overflow and keep the bottleneck far from the medical staff. After being vaccinated, the patients continued to the medical supervision room where they waited 15 min before they left the site.

Model B was preferred by the authors. In this model, six medics (one in each station) plus one medic who regulated the line flow and one to three nurses/paramedics manned a vaccination site. The maximal production was 147 vaccines per hour, which were equivalent to 24.5 vaccines per vaccination station per hour. The productivity from the nurse perspective was between 36.5 and 147 vaccines per nurse/paramedic per hour.

The COVID-19 pandemic posed great challenges to medical organizations worldwide. In situations like the abovementioned, medical directors should be involved with micro-management and tactical operational aspects in order to increase productivity and improve safety and quality. This information can assist organizations such as military camps, remote communities, or medically underserved areas that aim to increase output while utilizing only few highly trained medical professionals.

SUPPLEMENTARY MATERIAL

Supplementary material is available at Military Medicine online.

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