

## Adaptation of the French Military Health Service medical supply chain for the distribution of covid-19 vaccines

Since March 2021, the two French pharmaceutical military health supply establishments of the French Military Health Service (FMHS) have been distributing Comirnaty vaccines from the Pfizer BioNTech laboratory against COVID-19. The distribution of those vaccines is part of the vaccination campaign for the benefit of the personnel of the French Ministry of the Armed Forces, including those stationed outside the national territory.

Vaccines are stored thanks to ultra-freezers. Prior to the first receptions, we realized training sessions enabled the teams to best prepare for handling the vaccines and following the quality documents.

The main issue was to provide small quantities of vials (they are packed by 195 and delicate to handle in cold conditions) for a wide range of clients respecting high transport constraints.

According to the results of the stability studies of these products, we opted for autonomous transport to ship the vaccines. The time of transport had to be less than 12 hours at a temperature between +2 and +8°C for hexagonal France and in dry ice at -78.9°C for all exports outside hexagonal France including overseas operations. All expeditions were subject to temperature monitoring using single-use electronic loggers. The main challenge was to find packing boxes and order dry ice just in time.

Thanks to this shipment flow, we understood the maximum capacity of our carriers, built logistics circuits allowing us to deliver a maximum of sites with a minimum of vectors and face delivery difficulties both nationally and internationally. In addition, we learned to follow

temperature excursions of very short duration (<3 minutes) and how to plot them and to arbitrate parametrically on temperature excursions with temperature loggers and in their absence.

To conclude, in 2021, despite all the challenges, the FMHS made more than 2,000 national shipments and 40 international shipments for more than 80,000 vials.