The COVID-19 VACCINATION Landscape

Vaccine development is generally a complex, tedious process that can last up to 10-15 years.

Thanks to global collaboration, strong funding, and earlier coronavirus research, the first COVID-19 vaccine was authorized for emergency use in less than 1 year.

By the numbers...

12/14
2020 date of first vaccine administration in USA (per CDC)

150M+
Total doses administered in USA (as of 4/1/21 - per CDC)

$15B
Pfizer's estimated 2021 COVID-19 vaccine revenue (per Bloomberg)

16.4%
Of USA population has been fully vaccinated (as of 4/1/21 - per CDC)

THE KEY PLAYERS

Pfizer's vaccine exhibits ~95% efficacy
**According to the CDC*

Moderna's vaccine can be stored for up to 30 days
**According to Moderna*

Johnson & Johnson's vaccine requires just 1 dose

AstraZeneca's vaccine is widely used in Europe

Vaccine Production

The first approved COVID-19 vaccines were developed utilizing mRNA technology. mRNA vaccines teach our cells how to make a protein - or a piece of a protein - that triggers an immune response. That immune response produces antibodies which then protect us from viral infection. Development starts with biosynthesis, a process that creates plasmids which carry genetic material of the virus's spike protein. Other ingredients include lipids, salts (i.e. potassium chloride), acids, and acid stabilizers.

Vaccines are made in controlled environments which are ISO-certified cleanrooms using detectors, chromatographs, and other special components. Maintaining sufficient equipment, supplies, and furniture is crucial in ensuring that cleanrooms remain functional and efficient at all times.

Automation is a critical component in generating millions vaccine doses. Digitizing production data while simultaneously reducing manual processes allows lab technicians to multitask more efficiently.

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Vaccine Storage/Administration

Proper cold chain adherence and monitoring is critical to ensure vaccine supply potency. Overexposure to cold, heat, or light at any point during the transportation process can cause irreversible damage to the supply's efficacy. **Pfizer's** vaccine currently requires ultracold storage (-76° F to -112° F), while **Moderna's** can be stored at -20° F and **J&J's** at 36° F to 46° F. The right combination of ultra low temperature (ULT) and portable freezers will help maintain cold chain compliance.

Tracking devices, such as data loggers, are used to monitor and report vaccine temperature & inventory data during the journey from manufacturer to vaccine centers. Having a sufficient supply of PPE, syringes, alcohol wipes, and other required medical supplies allows for uniterrupted dose administration.

THE COVID-19 VACCINE COLD CHAIN

Vaccine Manufacture → Vaccine Transport → Arrival at Provider Facility → Storage and Handling → Vaccine Administration

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Thomas Scientific - at a Glance

#1
National pure-play distributor serving science

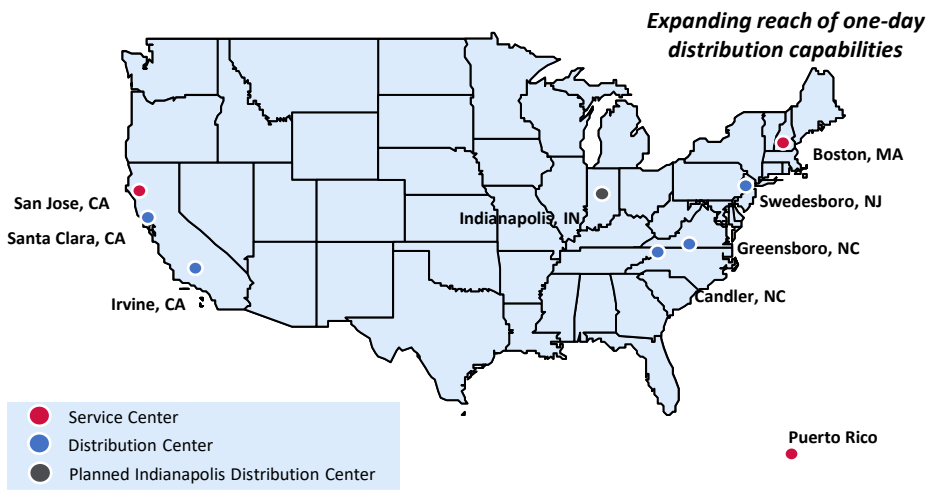
81%
of sales in Life Sciences in 2020A

368
Total full-time employees

~1
Average days to ship orders

178
Field sales professionals in the US

~1M
SKUs across five product categories



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