ZEBRA CAPTURE YOUR EDGE

We Have One Shot To Make Every Dose Count

Ensure proper temperature maintenance of COVID-19 Vaccines with Temperature Monitoring and Sensing Technology

Over the next year, the cold chain management of COVID-19 vaccines will impact the lives of billions of people.

Successfully distributing billions of doses of COVID-19 vaccines, all with slightly different stability profiles, through the cold chain will be an unprecedented task. These precious vaccine doses will be delivered at mass vaccination sites, drive through facilities, and 24/7 operations.

50% OF GLOBAL VACCINE WASTE STEMS FROM TEMPERATURE-CONTROL LOGISTICS AND SHIPMENT-RELATED ISSUES [1]

37.1% OF GLOBAL VACCINES ARE EXPOSED TO NONCOMPLIANT TEMPERATURES DURING STORAGE [2]

Impact of Vaccine Mismanagement

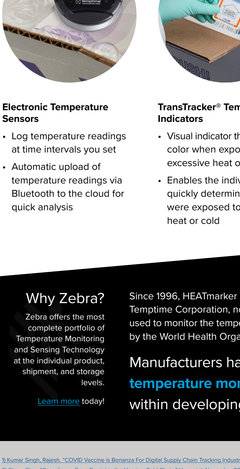
Maintaining the temperature of unprecedented volumes of vaccine vials through each stage of the cold chain will be an exceedingly difficult operation. Distribution of temperature-sensitive products involves many hand-offs, and each step in the process presents an opportunity for temperature excursions. When vaccine temperature protocols are not monitored — or are only partially monitored — along the distribution chain, potentially damaging temperature excursions may go undetected.

In addition, there are many points of failure that could happen, such as freezer or refrigerator breakdowns, weather-related shipping delays, power outages, etc.

Without the appropriate technology to identify heat-compromised vials, the efforts of healthcare professionals become even more complex and may result in:

1. Vaccine erroneously discarded due to suspected heat damage
2. Increased time to vaccinate the world's population
3. False sense of protection among the public, if given a vaccine exposed to damaging heat

In December 2020, a Wisconsin hospital was forced to throw out **more than 500 COVID-19 vaccine doses** that were rendered unfit for use due to temperature mismanagement by an employee. Because of the mismanagement, the hospital concluded that **57 vaccinations given** over a two-day period **were either less effective or ineffective.**[3]



Best Practices

1. Vaccine Vial Monitors (VVMs) are applied at the time of manufacture
2. Distributors and Logistics utilize Temperature Indicator Cards and/or Electronic Temperature Sensors to monitor temperature exposure of shipments
3. Administration sites utilize Temperature Indicator Cards and/ or Electronic Temperature Sensors to monitor temperature exposure of packages upon receipt and vials stored in freezers and refrigerators

Over the next decade,

10 YEARS

it's estimated that VVMs will allow workers to recognize and replace more than 200 million doses of damaged vaccines

200 MILLION

and confidently deliver more than a billion doses in remote settings—saving lives and reducing illness for countless people.[4]

$14 MILLION

VVMs save global health organizations approximately $14 million per year. [4]

With Zebra's diverse range of Temperature Monitoring and Sensing Technology,

each stage of the COVID-19 vaccine cold chain can leverage temperature monitoring innovation to gain actionable insights to ensure temperature management and assure vaccines that may have been heat compromised are identified up and until the very last mile.

Electronic Temperature Sensors

- Log temperature readings at time intervals you set
- Automatic upload of temperature readings via Bluetooth to the cloud for quick analysis

TransTracker® Temperature Indicators

- Visual indicator that changes color when exposed to excessive heat or cold
- Enables the individual to quickly determine if vials were exposed to excessive heat or cold

HEATmarker® VVM

- Visual indicator provides insight into cumulative heat exposure of individual vials
- In 2012, WHO determined VVM to be a "critical characteristic," a required element of all vaccine tenders submitted to UNICEF

Why Zebra?

Zebra offers the most complete portfolio of Temperature Monitoring and Sensing Technology at the individual product, shipment, and storage levels.

Learn more today!

Since 1996, HEATmarker Vaccine Vial Monitors, manufactured by Temptime Corporation, now a part of Zebra Technologies, have been used to monitor the temperature exposure of vaccines, as recommended by the World Health Organization and UNICEF.

Manufacturers have applied **over 9 billion vial-level temperature monitors on vaccines** distributed within developing countries since 1996.

1) Kumar Singh, Rakesh. "COVID Vaccine is Bonanza For Digital Supply Chain Tracking Industry," Reuters, December 17, 2020

2) Shaw, Gina. "Compliance Gaps Persist in the Vaccine Cold Chain," Vuvpoint. November 29, 2018

3) Almasy, Steve; Jones, Kay; Hanna, Jason. "Wisconsin Police Arrest Former Hospital Worker Whose Alleged Actions Led Hospital To Throw Out More Than 500 Vaccine Doses," CNN, January 1, 2021

4) Furtwangler, Tom. "The Vaccine Vial Monitor: The World's Smartest Sticker" Path. November 6, 2017

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