

USING DATA TO KEEP VACCINES POTENT

REMOTE TEMPERATURE MONITORING AND DATA USE TEAMS IN KENYA

Vaccination is one of the most effective strategies for preventing disease. However, its success depends on a well-managed cold chain that keeps vaccines within the WHO-recommended temperature range of 2 °C to 8 °C to ensure product quality and potency - from the time the vaccine is manufactured to when it is administered.

About the study:

Aim: To assess whether using remote temperature monitoring (RTM) devices and a structured, problem-solving and action-oriented approach for data use will facilitate better vaccine management

Location: Isiolo, Kajiado and Nairobi counties in the Republic of Kenya

Intervention:

- RTM devices were installed in 59 fridges across 18 sub-county vaccine stores and 18 high-volume health facilities. These devices sent out an SMS alert to staff anytime the temperature was above or below vaccines recommended temperature range. Temperature and time data were continuously collected and uploaded to the online ColdTrace dashboard.
- A structured, data- and people-centred approach for problem solving and action - known as IMPACT Teams - was introduced to improve vaccine management at all levels. JSI/inSupply has already successfully implemented this approach independently of the RTM system in 10 counties in Kenya and 6 other countries.

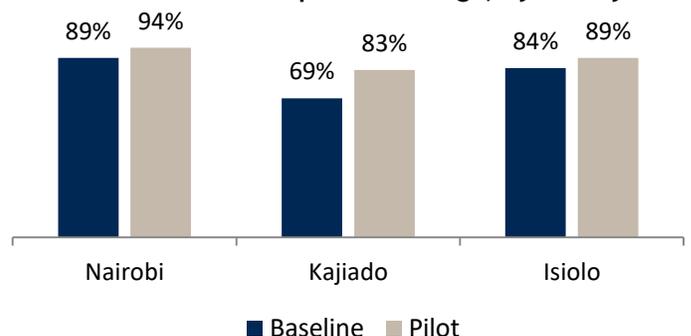
Design: Non-randomized, pre/post test design using quantitative and qualitative data

Research questions: How frequently are vaccines being exposed to temperatures outside the recommended storage range? Where are the problems occurring? Does the intervention improve the use of cold chain data in a cost-effective way?



The combination of technology and increased human capacity improves vaccine management outcomes. The intervention improved the percentage of time that refrigerators spent in the correct temperature range. The RTM devices triggered remedial action more quickly and efficiently than previous processes, and the IMPACT Teams supported effective behavior change in response to those triggers.

Percentage of total time that vaccines spent in the correct temperature range, by county



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Results:

Intensive IMPACT Team support and involvement leads to improved performance.

By bringing together key decision makers at all levels of the supply chain and empowering them to use data to problem solve and inform their actions, the IMPACT Team approach supported a noticeable improvement in vaccine management performance. Improvements can be attributed to: (1) greater responsiveness from vaccine management staff in the field, responding to cues to action from the RTM SMS alerts; and (2) great leaps in performance at the individual refrigerator level following identification and repair of problematic equipment. This requires coordination at multiple levels to identify and prioritize problems, locate parts, and allocate funding for repairs - exactly the kind of coordination that IMPACT Teams help to provide.

Reliable data helped to ensure a successful polio immunization campaign in Nairobi County

After recently detecting cases of polio in a Nairobi sub-county, the Kenyan Government decided to conduct a polio immunization campaign, and the county management team called on inSupply for support. IMPACT team members used the ColdTrace dashboard to identify the best refrigerators for storing polio vaccines, and the ITT dashboard to better understand current vaccine coverage in Nairobi. Data from both tools contributed to a more successful campaign.

Triangulating and visualizing a range of immunization-specific indicators and fostering use of the IMPACT Team approach for analysis and interpretation helps instill a culture of data use.

IMPACT Teams had access to multiple data sources: (1) the ColdTrace dashboard with refrigerator temperature information; and (2) the Indicator Tracking Tool (ITT) dashboard, with routine logistics and program coverage data. By incorporating all types of data and ensuring multi-disciplinary membership, IMPACT Teams gained a better understanding of the overall cold chain situation and the root causes driving performance challenges, and applied data-use concepts more effectively.

Despite a large upfront investment, the potential savings from protecting vaccines far outweigh the costs.

By reducing the number of vaccines exposed to out-of-range temperatures, the intervention potentially saved \$85,000 worth of vaccines every month, or about 17% of the total value of vaccines in refrigerators included in the pilot on an average day. While the RTM system cost approximately USD \$100,000 to set up across the three counties, the subsequent monthly costs of upkeep for the RTM devices and technical support to all IMPACT Teams were modest - about 2% of the total cost of the vaccines in the pilot refrigerators on an average day, or 1% of the cost of the estimated maximum daily vaccine stock. Extrapolating from our very small sample, we estimate that scaling up the intervention to all 298 operational sub-county stores would protect approximately \$8 million in vaccines on an average day. If, similar to the pilot, scaling-up resulted in a 9.2 percentage point reduction in the value of vaccines potentially lost to temperature excursions each month, this would translate into savings of about \$725,000 per month in avoided vaccine losses.

Persistent gaps in knowledge and skills decrease the effectiveness of the intervention.

Both before and after the intervention, some cold chain personnel were not clear about basic concepts and procedures related to vaccines, such as which vaccines are sensitive to heating or freezing. Lack of job aids and guidelines for prevention and maintenance of cold chain equipment was also a gap. These knowledge gaps and behaviors - while not intended to be addressed by the intervention - likely affected the overall results of the pilot.

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