

Vaccine Vial Monitors

Health need

To avoid harmful heat exposure which can detrimentally impact potency, vaccines require a cold chain, a global distribution network of equipment and procedures for maintaining product quality (potency) during transport, storage, and distribution. Despite these efforts, temperature variations frequently occur in both developed and developing countries. In the past, there was no way to detect whether individual vaccine vials had been exposed to heat, so national immunization programs adopted conservative guidelines for the handling and disposal of vaccines when heat exposure was suspected. In 1985, PATH launched a search for suitable technologies that could indicate exposure to heat. An appropriate technology used in the food industry was discovered, and PATH worked with the manufacturer to adapt it for vaccines, resulting in a product known as the vaccine vial monitor (VVM).

Technology solution

VVMs are small circular indicators printed directly on vial labels or adhered to the tops of vials. The inner square is chemically active and changes color irreversibly from light to dark with exposure to heat over time. By comparing the color of the inner square to the reference color, a health worker can determine whether the vaccine has been exposed to heat. With the VVM, important decisions on whether to use or discard vaccine and which vials should be used first are now clear. VVMs can be manufactured for a variety of heat-exposure specifications suitable for use with any vaccine.

Current status and results

Since their introduction in 1996, VVMs have helped to ensure that undamaged vaccine is used to immunize children and to extend the reach of services, raising coverage. The presence of VVMs also made it possible for the World Health Organization (WHO) to implement the “multi-dose vial policy,” which allows health workers to use opened vials of some liquid vaccines for more than one day. This has markedly reduced vaccine wastage, helping immunization programs to save millions of dollars. VVMs are also used to help manage and improve vaccine distribution.

VVMs are manufactured by the Temptime Corporation in New Jersey under the product name HEATmarker® and are sold to vaccine producers throughout the world. WHO requires that all vaccines purchased through the United Nations Children’s Fund (UNICEF) use VVMs. A WHO/ UNICEF joint policy statement urges all vaccine self-procuring countries, donor agencies, and international organizations to include VVMs among the minimum requirements for vaccine purchase agreements and donations. Since their introduction in 1996, more than 5 billion VVMs have been used on vaccine vials, helping to ensure patients receive fully potent vaccines. By preventing the discard of undamaged vaccines, WHO and UNICEF estimate that the use of VVMs saves the global health community at least US\$14 million per year.

HEATmarker is a registered trademark of the Temptime Corporation.



Labels on vaccine products to indicate heat exposure.

“Used properly, this [vaccine vial monitors] can be a miracle tool to reduce wastage and prevent the use of heat damaged stock.”

Umit Kartoglu, WHO
Department of Vaccine and
Biologicals. *GAVI Immunization
Focus*, July 2003.

Availability

For more information on HEATmarker® VVMs, contact Temptime Corporation
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Morris Plains, NJ 07950, USA
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For more information regarding this project, contact Debra Kristensen at dkriste@path.org.

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