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## World's smartest sticker

### For ten years vaccine vial monitors have flagged spoiled vaccine

*Update: Vaccine vial monitors will be used with the new Menafrivac™ vaccine being introduced in sub-Saharan Africa. This vaccine is the first developed specifically for Africa, and it will protect millions against deadly meningitis.*

[Read more about this important global health milestone.](#)

Imagine the challenge of getting the extremely heat-sensitive polio vaccine from a high-tech pharmaceutical company in Belgium to a remote village in Ghana. The vaccine leaves by truck, is flown to Africa, and then is carried across dirt roads by truck or bicycle to eventually reach a refrigerator in a rural clinic that has sporadic electricity. The journey may take days or weeks, during which the vaccine is constantly at risk of being spoiled. Too often these vital vaccines are damaged but still used, or they're tossed out because health workers have to assume they have gone bad.

PATH found a technology originally used by the food industry to save perishable products and worked with its owners to adapt it so that it could be used to address the "cold chain" problem. The vaccine vial monitor is a small sticker, no bigger than a dime, that adheres to the vaccine vial and changes color as the vaccine is exposed to heat. The color of the sticker tells health workers whether the vaccine is bad—or can be safely used for immunization. No more uncertainty, no more waste.



This three-minute video tells the story of the vaccine vial monitor in Kenya.

#### VACCINE VIAL MONITOR

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## Vaccine vial monitors take the heat

Starting in the late 1970s with funding from the US Agency for International Development, PATH worked with the World Health Organization (WHO) to identify a solution and then teamed up with the TEMPTIME Corporation to develop vaccine vial monitors (HEATmarker™) that are printed directly on vaccine vial labels and darken with exposure to heat over time.



Vaccine vial monitors change color with exposure to heat.

In 1996, the first monitors became commercially available for oral polio vaccine, adding only a few cents to the price of each vial. Today, monitors are available for all vaccines used in immunization programs in developing countries, and UNICEF requires them on all vaccines they purchase. Health workers can make informed decisions about whether vaccine vials need to be thrown away due to heat exposure and feel confident that vaccine they use has not been damaged by the heat. PATH and WHO have developed and tested training materials for health workers that help them learn how to handle vaccines and use the monitors effectively.

During the May 2006 earthquake in Yogyakarta, Indonesia, electricity went out at health facilities for several days. Vaccine vial monitors showed that most vaccines were undamaged, despite the heat, and still usable—saving 50,000 doses of vaccine that otherwise would have been thrown away.

## Saving lives and resources

Last year marked the tenth anniversary of the vaccine vial monitor. PATH estimates that over the *next* ten years, vaccine vial monitors will allow health workers to recognize and replace more than 230 million doses of inactive vaccine and to deliver 1.4 billion more doses in remote settings—actions that could save more than 140,000 lives and reduce morbidity for countless others. Thanks to the presence of the monitors, WHO was able to revise its policies to allow open vials of liquid vaccine to be used for more than a single day. That alone has saved immunization programs around the world millions of dollars. UNICEF and WHO have estimated that the use of monitors, even if only on basic



vaccines, could save the global health community \$5 million per year.

*HEATmarker is a trademark of TEMPTIME Corporation.*

*Photos (top to bottom): PATH, PATH/Jennifer Fox.*

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