Tanzania leading the way with barcodes on vaccine packaging

by Daniel Thornton, GAVI; Henry Mwanyika, PATH; Drew Meek, WHO; Ulrike Kreysa, GS1

A project in Tanzania is exploring how best to implement barcodes on vaccine packaging. By adding barcodes to the shipping containers and secondary packaging used to transport vaccines, project organizers hope to learn how barcode technology can improve supply chain management and vaccine safety in developing countries.

Over the last forty years, barcodes have transformed global supply chains in the packaged food and consumer products industries. Most supermarket chains around the world use barcode scanners at the checkout counter and most smartphones can now scan barcodes. Barcodes make it easy to track the flow of goods from their point of origin to their final destination, to recall products that may pose a safety hazard, to detect counterfeit or fraudulent goods, and to link a product with information such as where it was made, where it has been, ingredient lists, and instruction manuals in multiple languages.

The global immunization community has recently started to explore the potential of using barcodes in vaccine supply chains. In fact, some countries have already begun to establish and mandate their own barcode standards. But with developing-country immunization programs lacking the infrastructure required to scan and use barcode information, and without a global barcode standard to follow for vaccine products, the use of barcodes on vaccine products destined for developing countries is happening much more gradually.

Electronic health information systems are becoming increasingly pervasive in developing countries, especially at the central warehouse level. This has reduced some of the barriers to the use of barcodes, and at the same time made the need to establish global standards more pressing than ever. Such standards would make it much easier to correctly implement and interpret barcodes coming from different suppliers around the world.

In March 2013, a working group of the Vaccine Presentation and Packaging Advisory Group (VPPAG) met in Brussels, Belgium to identify the challenges and set out a long-term vision for the adoption of barcode technology in developing country vaccine supply chains. The meeting was hosted by GS1, the nonprofit global supply chain standards organization, and was attended by representatives from UNICEF, WHO, PATH, GAVI, and several vaccine manufacturers. The group concluded that:

- There are no longer any major obstacles to the introduction of barcodes on secondary packaging and packaging containing secondary packaging.
- Adding barcodes with lot number and expiry date information to primary packaging poses a technical challenge that may take several years to overcome.
- Overall agreement exists on standards for the type of information that should be included in barcodes, the type and format of barcode to use, and the levels of packaging on which it should be included.
- Online databases need to be established where barcode information can be retrieved (for example, for a logistician to find out that the item he has just scanned is a box of 25 vials of

MMR vaccine that needs to be stored between 2°C to 8°C). An existing WHO vaccine product database can potentially be adapted to serve this purpose.

- The planned project in Tanzania presents a great opportunity to evaluate the benefits of using barcodes on vaccine packaging.

For the project in Tanzania, collaborating manufacturers will add barcodes to the shipping containers used to transport vaccines to Tanzania. Encoded in each barcode will be a serial shipping container code (SSCC), an 18-digit number used to identify individual containers and provide dispatch information. In parallel to the shipment, an advanced shipping notice will be sent. Upon arrival, the barcodes will be scanned by logisticians to automatically generate key sections of the vaccine arrival report.

Collaborating manufacturers will also add barcodes to secondary packaging to enable staff to keep track of vaccines as they move further down the supply chain from national to regional and then to district level. Encoded in these barcodes will be the product's global trade item number (GTIN), as well as the lot number and expiry date of the vaccines contained in the secondary packaging. This will enable Tanzanian logisticians to keep better track of vaccine stock movements.

Because the benefits of barcodes to vaccine supply chains is becoming increasingly evident, and interest among developing-country governments in barcodes continues to grow, it will be critical for vaccine products with barcodes to be ready in the public-sector supply chain. For this to happen, both global- and national-level decision-makers can take positive steps toward a future where barcodes are an essential component of vaccination programs.

To learn more about the work of the VPPAG barcode working group, please contact Daniel Thornton (dthornton@gavialliance.org), Henry Mwanyika (hmwanyika@path.org), Drew Meek (meekd@who.int), or Ulrike Kreysa (ulrike.kreysa@gs1.org).

To read more about the need for global barcode standards and the readiness of developing countries to introduce barcodes, please read the article 'Is it time to start barcoding vaccine labels?' in the July 2011 edition of the *Op.ti.mize* newsletter.