Trends in Vaccine Presentations and Packaging

Developing Countries Vaccine Manufacturers Network Meeting
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Take Home Messages*

1. There is work under way that may directly affect your company's future vaccine products.
2. You can play a role in developing guidance for future vaccine presentations and packaging for developing-country markets.
3. The time to act is now.

* For DCVMN members

How do I take advantage of this intriguing offer?

Become Involved in the VPPAG*

- Serves as a forum for industry and public-sector dialog and consensus building on presentation and packaging of vaccine products.
- Facilitates improvements in presentation and packaging of vaccine products through development of preferred product profiles.
- Responds to industry requests for guidance on specific product presentation issues.
- Convened by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF).
- Standing subcommittee of the WHO Immunization Practices Advisory Committee (IPAC).

* Vaccine Presentation and Packaging Advisory Group

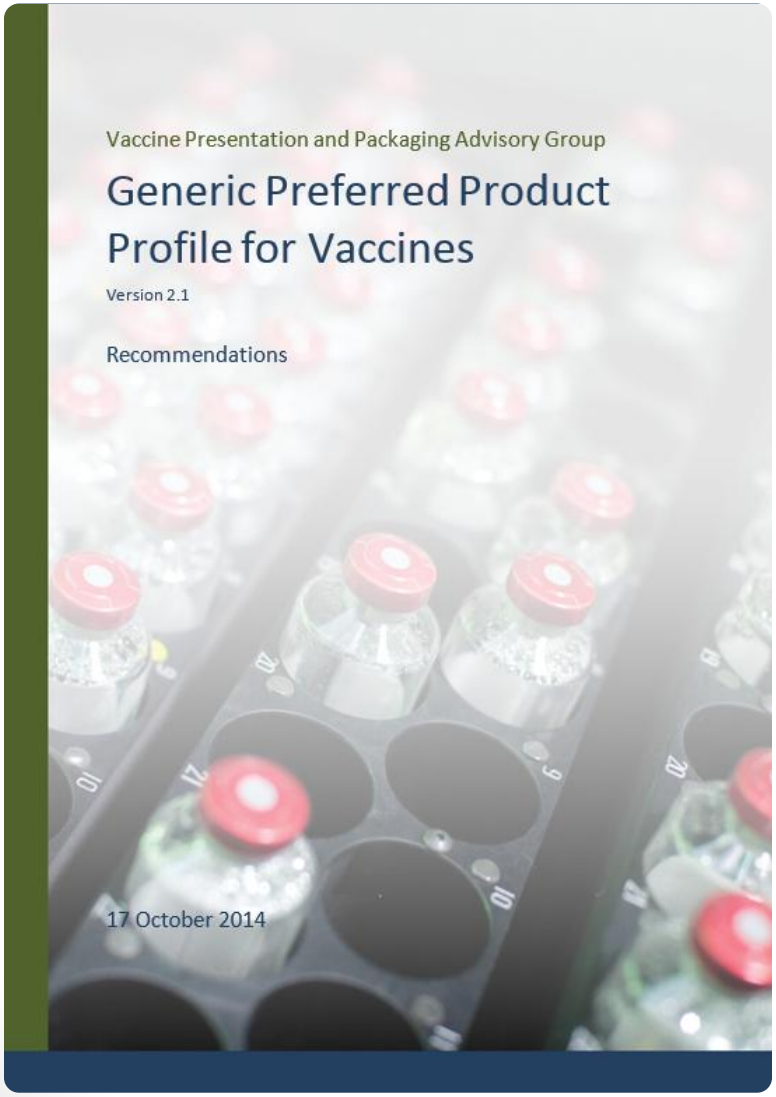
Current Members

Name	Representing
Andrea Arancibia	International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)—Alternate (Sanofi Pasteur)
Dmitri Davydov (Secretary)	UNICEF Programme Division
Ousmane Dia	John Snow, Inc.—Alternate
Sy Gebrekidan	IFPMA (Merck)
Anna-Lea Kahn	WHO, Expande[illegible]me on Immunization (EPI); Immunization, Vaccines a[illegible]icals (IVB)
Debra Kristensen (Chair)	PAT[illegible]
Drew Meek	[illegible] Quality, Safety and Standards (WHO/QSS)
Ann Ottosen	UNICEF Supply Division
Raja Rao	Bill & Melinda Gates Foundation
Hardeep Sandhu	US Centers for Disease Control and Prevention
Inderjit Sharma	**DCVMN (Serum Institute of India, Ltd.)**
Robert Steinglass	John Snow, Inc.
Daniel Thornton	Gavi, the Vaccine Alliance, Secretariat

DCVMN Alternate Needed!

VPPAG Accomplishments

Generic Preferred Product Profile



Recommendations on:

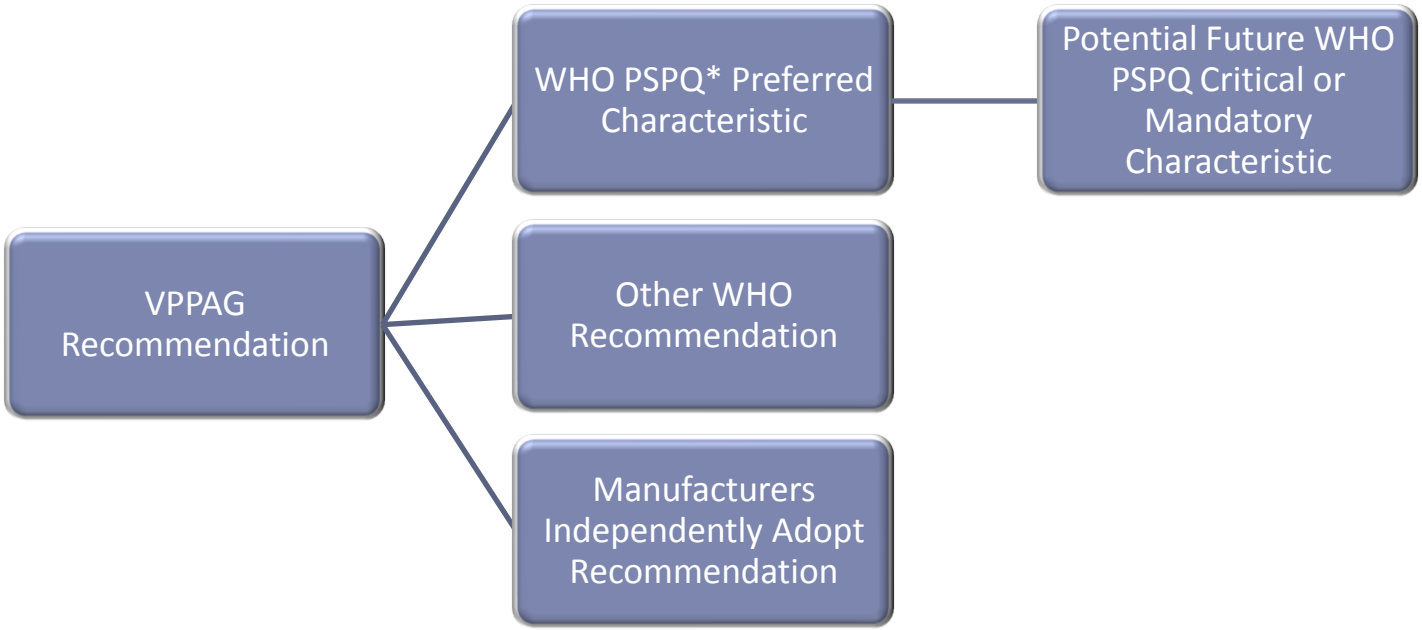
Formulation
- Single versus multi-component vaccines
- Heat stability
- Freeze stability
- Antimicrobial preservatives

Presentation
- Product format
- Container type
- Prefilled injection systems
- Doses per primary container
- Primary container dimensions

Packaging
- Secondary carton dimensions
- Tertiary carton dimensions
- Materials

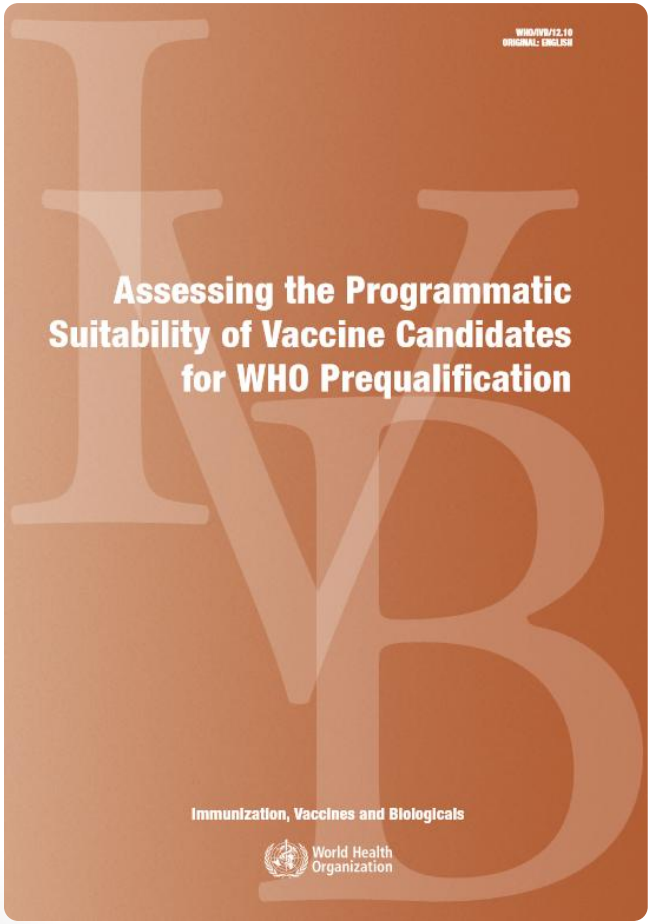
Labeling
- Primary container label
- Vaccine vial monitors
- Carton and packaging labels
- Package inserts

Impact of VPPAG Recommendations



* PSPQ = WHO Programmatic Suitability of Vaccine Candidates for Prequalification

VPPAG Recommendations in WHO's Programmatic Suitability of Vaccine Candidates for Prequalification (PSPQ)



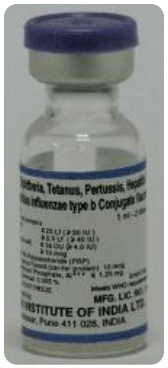
http://tinyurl.com/WHO-IVB-12-10

Table 4: Preferred vaccine characteristics and characteristic values

Characteristic	Applies to...	Value
Maximum packed volume	All vaccines	A smaller packed volume is preferred. Where appropriate, components should be packed/shipped together, e.g. for ready-to-use presentations: pre-filled AD syringe with needle, etc.Packaging devices should be considered, to assure components are shipped together, e.g. vial clip. (WHO EPI, VPPAG gPPP: maximum packed volume; see Guidelines on the international packaging and shipping of vaccines11 .
Dose volume	Oral vaccines	Smaller volumes and standardized volumes are preferred (WHO EPI).
Doses per primary container, non-campaign setting	All vaccines	Vials with ≤10 doses per vial are preferred (WHO EPI, VPPAG gPPP: optimal number of doses per primary container, work programme).
Doses per primary container, campaign setting	All vaccines	Vials with ≥ 0 doses per vial are preferred (WHO EPI).
Doses per secondary container	All vaccines	Should reflect logistics schedule and needs in order to minimize stock accumulation at the peripheral level (WHO EPI).
Process of preparation for administration	All vaccines	Single component/ready to use (e.g. liquid) formats are preferred (WHO EPI). For multi-component vaccines, vaccines with a short and simple preparation process are preferred (WHO EPI).
Thermo stability / storage	All vaccines	Vaccines and diluents that can be stored for extended periods at temperatures above +8°C are preferred (TLAC).
Freeze sensitivity	All vaccines	Vaccines that are not damaged by freezing temperatures (<0°C) are preferred (TLAC).
Materials, primary and secondary packaging and injection material	All vaccines	Materials that minimize environmental impact are preferred (VPPAG gPPP: materials).
Secondary packaging, diluents and vaccines	Vaccines requiring reconstitution	Diluents and vaccines should have the same number of doses per secondary container.

VPPAG Recommendation Influencing WHO Label Requirements

- VPPAG recommendations made on content and language requirements for primary containers:
  - Expiry date format (mm-yyyy)
  - Standard generic names for vaccines
  - Minimum font size and type
  - Minimum viewing area
  - Consistent layout



- Recommendations endorsed by WHO's Immunization Practices Advisory Committee (IPAC) and Executive Committee for Biological Standardization (ECBS).
- WHO advancing recommendations for inclusion in PSPQ and in technical report series No. 822.[1]

1. See http://tinyurl.com/pspq2-keyissues

VPPAG Recommendation Voluntarily Adopted by Industry: Crucell Quinvaxem®

Crucell took advantage of a production line switch to reduce the volume of their 1-dose pentavalent vaccine vial from a 3 ml to a 2 ml vial – a 24% reduction in primary packaging.

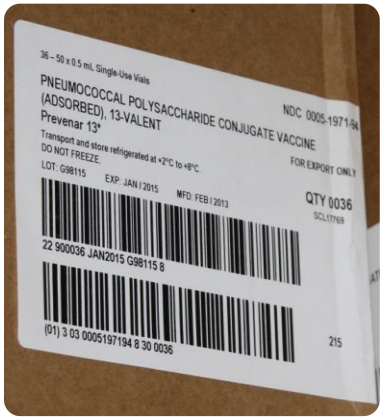
Secondary packaging reduced from 13.1 cm^3 to 10.3 cm^3

Old packaging	New packaging
Primary: 3 ml vial 1.64 cm dia x 4.1 cm high	Primary: 2 ml vial 1.64 cm dia x 3.1 cm high **24% volume reduction**
	
Secondary carton: 17 x 8.5 x 4.1 cm – 50 vials	Secondary carton: 17 x 8.5 x 3.6 cm – 50 vials **12% volume reduction**
	
Tertiary carton: 34.5 x 26.5 x 28.5 cm – 1,800 vials	Tertiary carton: 34.5 x 26.5 x 28.5 cm – 2,100 vials **17% increased vial capacity**
	
Shipping carton: 78 x 65 x 53 cm with 2 x tertiary cartons - 3,600 vials	Shipping carton: 78 x 65 x 53 cm with 2 x tertiary cartons - 4,200 vials **17% increased vial capacity**
	

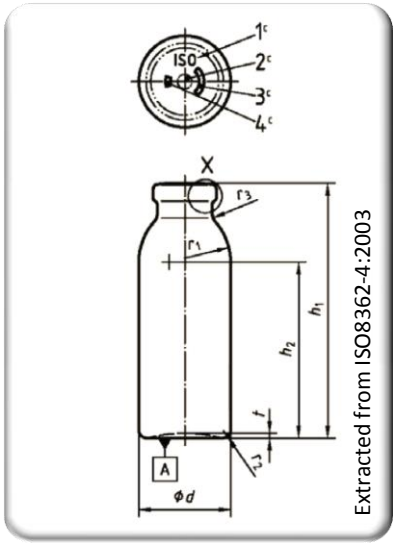
Source: Crucell, Korea

Three Trends in Vaccine Presentation and Packaging

Barcodes



Minimizing vaccine container dimensions



Extracted from ISO8362-4:2003

Labeling vaccines for higher-temperature storage

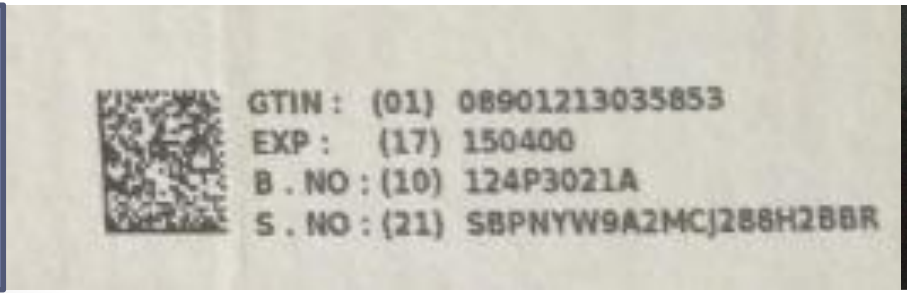
Trend 1: Barcodes

- Strong VPPAG working group* with participation from the vaccine industry and support from GS1.
- VPPAG recommend barcodes conforming to GS1 standards and specifications encoding Global Trade Item Number (GTIN), batch/lot number, and expiry date on secondary and tertiary packaging for vaccines and diluents.

* Led by Daniel Thornton (Gavi) and Rich Hollander (IFPMA/Pfizer)

Ongoing Barcode Work

- Study under way, led by PATH, to assess the feasibility of barcode use on tertiary and secondary packaging and the business case for scaling up barcodes in Tanzania.
- Majority of vaccine manufacturers will include GS1 barcodes on vaccine shipments sent to Tanzania by Q4 2014.
- Next steps include further development of technical standards for barcodes and providing guidance for implementation.



Opportunities for DCVMN Members

- Participate in tests of packaging samples that conform to GS1 standards.
- Provide feedback on barcode technical manual and guidance for implementation.
- Join barcoding working group.

Public-sector goal:
In five years, donors, multilateral organizations, and countries can track the movement of vaccines from manufacturer to recipient through the use of inexpensive, easily usable, and reliable barcode technology.

Trend 2: Minimizing Container Dimensions

- New norms developed for dimensions for <u>future</u> primary, secondary, and tertiary vaccine packaging.
- Movement toward ISO (International Organization for Standardization) standards.
- Example: "*For vials: Vaccines in presentations from one to five 0.5 ml doses are recommended to be filled in a '2R' vial conforming to ISO 8362 dimensions. Where technically possible, and if the dose size permits, manufacturers are encouraged to reduce the height of the vial from the current standard of 3.5 cm to 3.1 cm or less, both for reasons of volume reduction and dimensional harmonization*."

Photo: Crucell, Korea

Opportunities for DCVMN Members

- Use new dimension guidance for all new vaccine products and, where possible, when changes are made to an existing vaccine product (e.g., changes in formulation or production that require regulatory resubmission).

Public-sector goal:
Reduce the physical bulk of vaccines for developing-country immunization programs to enable countries to add new vaccines to their schedules while limiting the additional burden on cold chain and logistics systems.

Trend 3: Labeling Vaccines for Higher-Temperature Storage

- In 2012, the meningitis A vaccine MenAfriVac® became the first WHO prequalified vaccine labeled for use for a period of up to four days at temperatures of up to 40°C.

All photos: PATH

Labeling Vaccines for Higher-Temperature Storage

- VPPAG recommendation:
  - Vaccines should be stable at standard cold chain temperatures (2°C to 8°C).
  - Maximize vaccine heat stability to the extent possible to improve effectiveness, enable higher-temperature storage, and enable taking the vaccines beyond the cold chain.
  - License and label products for higher-temperature storage immediately prior to administration, using 40°C as the target-threshold temperature whenever possible.

Opportunities for DCVMN Members

- Optimize vaccine stability during product development.
- Conduct stability testing to qualify and label new vaccines for higher-temperature storage wherever possible.

Public-sector goals:

- Provide additional information about vaccine heat stability to those managing vaccines.
- Increase immunization coverage and ease logistics for campaigns and special outreach strategies.

Ways to Become Involved in VPPAG

1. *Provide feedback on VPPAG documents:* The VPPAG distributes documents with background information and draft recommendations to DCVMN members through the DCVMN representative(s).
2. *Have company representatives serve on VPPAG working groups:* The VPPAG has a number of ongoing working groups that require representation from certain areas of industry expertise (e.g., regulatory, packaging, etc.).
3. *Request a bilateral consultation with the public-sector members of the VPPAG*: If your company would like public-sector feedback on an issue related to the presentation and packaging of a vaccine of importance to developing countries, you can request a confidential consultation with the public-sector members of the VPPAG.
4. *Dial into a monthly conference call*: The VPPAG currently meets by phone for one hour on the second Tuesday of each month at 4 PM (London or GMT).

For More Information

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http://tinyurl.com/vppag