

Freeze-prevention technologies to protect vaccine potency

Isaac Gobina

WHO Department of Essential Medicines
and Health Products (EMP)

TechNet Conference
16 – 20 October 2017
Cascais, Portugal



Outline



The challenge:
Eliminating the risk of vaccine freezing



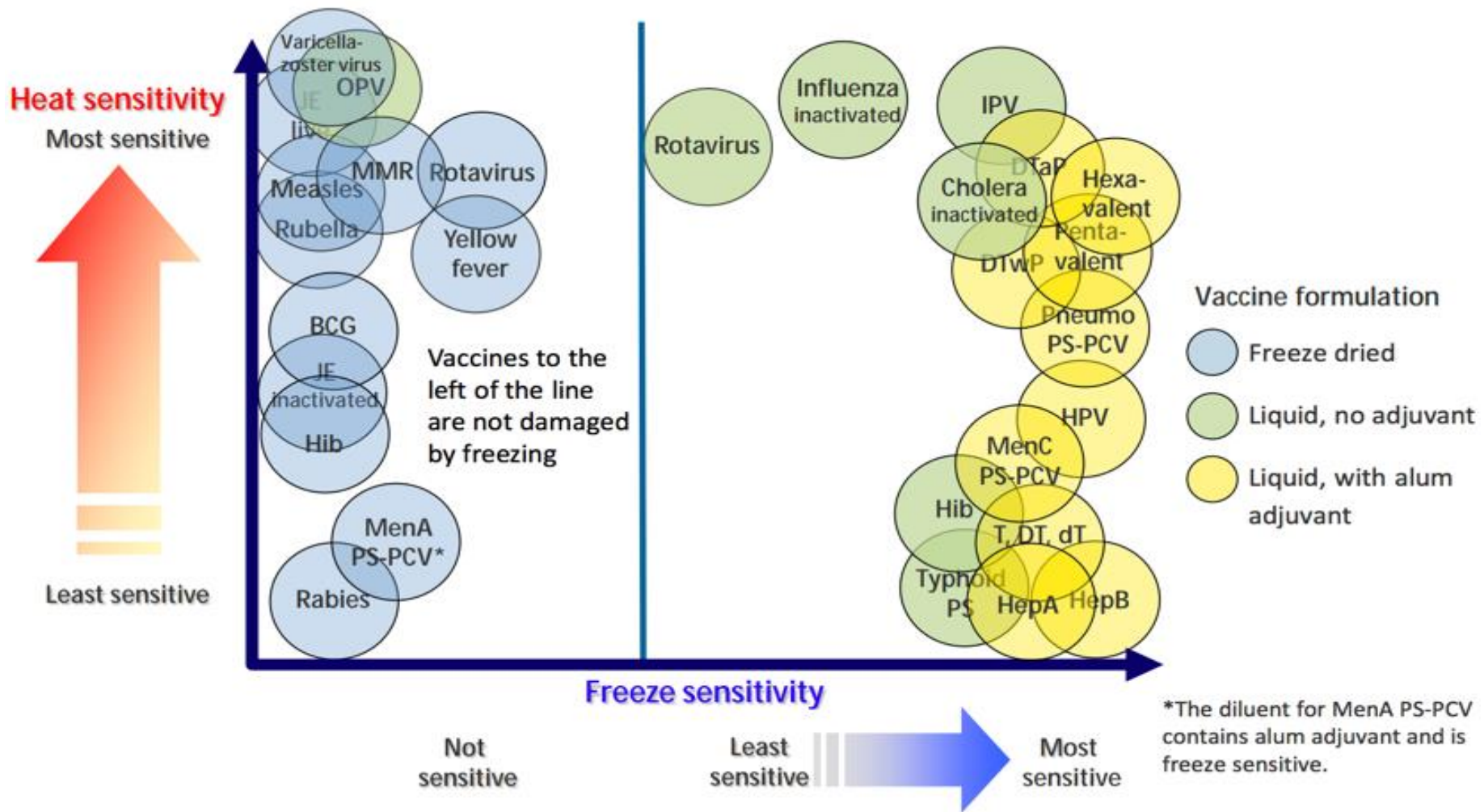
The solution:
Reducing need for user intervention



The technologies:
Refrigerators, cold boxes & carriers



Varying heat sensitivity of vaccines



The challenge: vaccine potency /1

- Vaccines may freeze in refrigerators if the temperature in the vaccine storage compartment drops below 0°C.
- Unconditioned icepacks can cause vaccine freezing in cold boxes and carriers.



WHO/PQS (file photo)

The challenge: vaccine potency /2

- In addition, freezing of freeze-sensitive vaccines usually goes **unnoticed** and is **irreversible**, leading to loss of potency of vaccines being administered.
- By consequence, the population is vaccinated but **not protected**.



WHO/PQS (file photo)

The challenge: vaccine potency /3

- Until now vaccine freeze prevention was user-managed to safeguard vaccine potency.
- This can be time-consuming, vulnerable to user-error, oversight or capacity constraints.



PATH/Brian Atuhaire.

The solution: **reducing need for user intervention**

- **PQS standards** now focus on reducing user-managed freeze prevention.
- Autonomous equipment freeze protection features can **significantly reduce freezing risk**.
- User feedback on performance, and technical advances in other industries helps drive **innovation**.



PATH (uncredited)

The technologies: Refrigerators /1

Adopting the freeze-protection grading system

- The freeze protection classification is based on the number of **user interventions** required to ensure freeze protection.
- The classification (**Grades A, B, C**) have been applied to all current available PQS-qualified refrigerators.

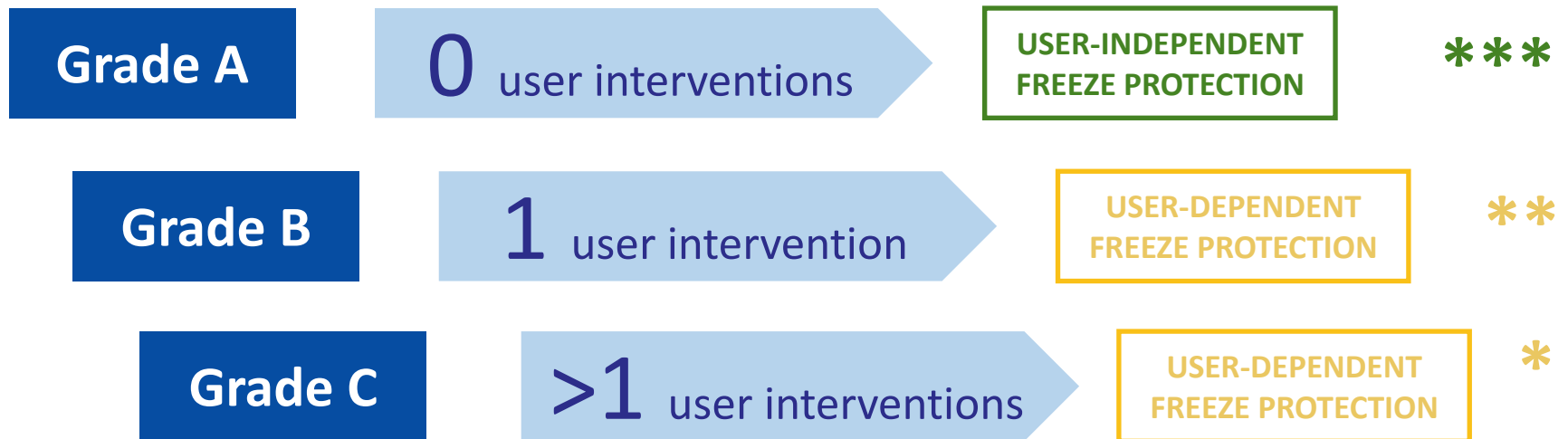
Freeze prevention User interventions

- Managed use of baskets
- Manual defrosting
- Manual adjustment of thermostat

The technologies: Refrigerators /2

Adopting the freeze-protection grading system

- Number of user interventions required to eliminate freeze-risk outside acceptable temperature range*.



* When appliance used within nominated temp. range (upper hot zone temp. +43°C and minimum rated ambient temp.)

The technologies: **Cold boxes & vaccine carriers**

New product categories with freeze-prevention technology

- Cold boxes & vaccine carriers that protect against freezing even when using **non-conditioned** icepacks.
- Protect against freezing when using icepacks as cold as **-25°C**.
- When frozen icepacks can be used, this **simplifies preparation and training** needs (long term).

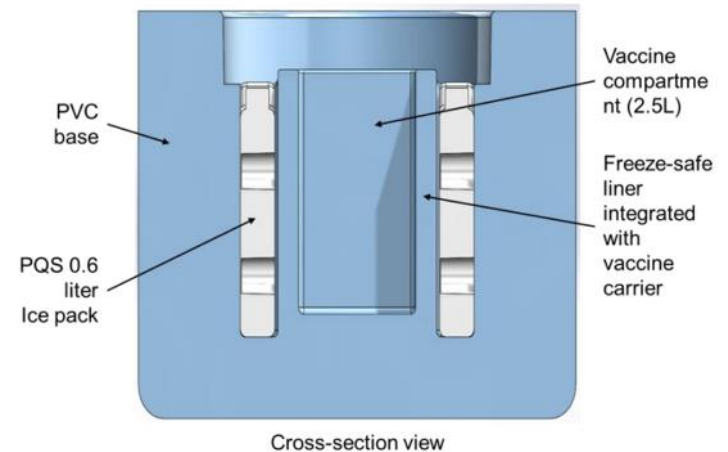


UNICEF India/2015/Dhiraj Singh

The technologies: **Cold boxes & vaccine carriers**

New product categories with freeze-prevention technology

- **Standards** for freeze-free cold boxes and vaccine carriers have been developed and published.
- A small number of developers are working on the products as we speak.



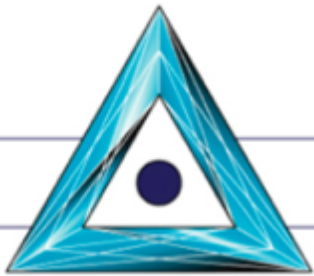
PATH (uncredited)

Thank you!

To national EPI programmes

To equipment manufacturers

To collaborating partners: BMGF, CHAI, Gavi, PATH, SELF, UNICEF, and independent consultants



PERFORMANCE QUALITY SAFETY

