

# VACCINE DOSE PER CONTAINER: DECIDING WHAT'S RIGHT FOR YOUR IMMUNIZATION PROGRAM



Immunization programs in low- and middle-income countries have historically used multi-dose vials to offer lower prices and minimize constraints on cold chain storage space. As newer, more expensive vaccines are introduced in multi-dose formats, however, the burden of cost efficiency potentially moves from the national-level Ministry of Health to the health care worker.

To achieve maximum utilization of every dose in a vial, health care workers (HCW) need to be strategic about when to open a container, diligent about how they care for open containers, and potentially more active to ensure optimal attendance at immunization sessions and timely vaccination of every child. This calculation may reduce their willingness to open a container for every eligible child they see. Thus, the number of doses per container (DPC) may impact the ability to efficiently achieve a country's goals of timely, safe, and equitable vaccination coverage.

Assessing which dose per container presentations are appropriate given a country's programmatic and financial priorities requires understanding the complex relationship between six immunization system components (in box below).



To help immunization stakeholders make effective DPC decisions for their country context, the Dose Per Container Partnership (DPCP) has developed generalized information based on the partnership's research in a number of countries.

## DPCP STUDY FINDINGS: Lowering DPC saves costs due to reduced wastage...up to a point

Generally, for more expensive vaccines, there is a higher likelihood that when switching to a presentation with fewer DPC, a reduction in costs due to reduced wastage would outweigh the increase in costs due to the higher price per dose. But there is a threshold: with very inexpensive vaccines (like BCG), fewer DPC will cost more in procurement costs due to the higher price per dose.

## Five Steps to Guide DPC Decisions

Immunization programs can take these broad steps when considering DPC for a specific vaccine (assuming other attributes — such as effectiveness, preservative inclusion, or stability — are the same or at least comparable).



## Six Key Considerations for the DPC Decision

Based on DPCP evidence, six key considerations for the DPC decision have been developed to provide insight into weighing the trade-offs and enable stakeholders to apply these considerations to their own country context:

### 1 COVERAGE AND SESSION SIZE AND FREQUENCY:

Different DPC presentations can enable closer alignment with immunization session sizes to optimize timely coverage and reduce wastage.

**2 HEALTH CARE WORKER BEHAVIOR:** Vials with fewer DPC can reduce the hesitancy to open them, improving timely coverage and reducing missed opportunities to vaccinate, while also limiting wastage.

**3 COLD CHAIN REQUIREMENTS:** Increases in cold chain requirements after changing to vials with fewer DPC are often less significant than expected.

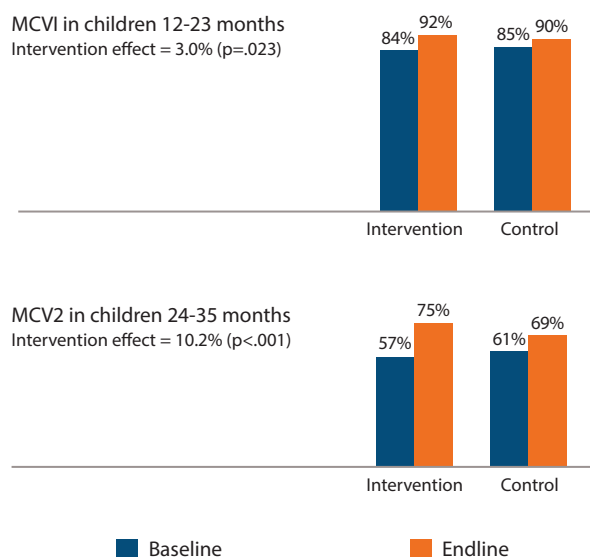
**4 ANNUAL FORECASTING PRACTICES:** When switching to a different DPC presentation for a particular vaccine, annual forecasting and monthly estimation should adjust the overall quantities based on different wastage rates, overall volume requirements, and potential changes in vaccine use associated with different DPC.

**5 WASTAGE RATE AND COSTS:** Using vials with fewer DPC can reduce vaccine wastage, the savings from which can sometimes offset the higher price per dose, resulting in fewer vaccines needing to be procured.

**6 TRADE-OFFS OF ALL COMPONENTS:** When selecting a vaccine product presentation, decision makers must weigh trade-offs, which may include impact on high and timely coverage, equity, safety, wastage, supply chain capacity, costs (of the vaccines as well as logistics and service delivery costs), and health care worker behavior.

### DPCP study findings: The positive impact of lower DPC on coverage, wastage rates, and supply chain in Zambia

The results of the implementation research in Zambia show a three percentage point increase in the coverage of first dose of MR among children in districts using 5-dose MR vials compared to those using 10-dose vials (based on vaccination card plus caregiver recall), and a 10 percentage point increase in the coverage of second dose of MR. The coverage rate results validate the HCW reported behavior that they are more willing to open a 5-dose MR vial for any number of children. Wastage rate decreased from 31% to 16% for districts using 10-dose and 5-dose MR respectively. Also, cold chain equipment at facilities could easily accommodate the switch to 5-dose MR with no constraints.



The Dose Per Container Partnership (DPCP) came together to support vaccine product and program decision making when choosing DPC.

Funded by the Bill & Melinda Gates Foundation (BMGF) and implemented by JSI — in partnership with the Clinton Health Access Initiative (CHAI); PATH; the International Vaccine Access Center (IVAC) and Institute for Vaccine Safety (IVS) through Johns Hopkins University; the Bloomberg School of Public Health; Agence Médecine Préventive (AMP); and the HERMES Logistics Modeling Team — DPCP builds upon existing evidence to assess how DPC choices affect immunization system tradeoffs.

**For more information on dose per container considerations and decision making, and to review full results of DPCP research, please visit [www.jsi.com/dpcp](http://www.jsi.com/dpcp).**