

Measles-Containing Vaccines: Supply & Demand Outlook

UNICEF Supply Division

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This informational note summarises the demand and supply availability through UNICEF in 2015 for measles-containing vaccines.

A more recent note covering MCV exists at: <https://www.unicef.org/supply/market-notes-and-updates>

1. Summary

- **Measles-containing vaccines (MCV)** refer to measles monovalent (MV) vaccines, measles and rubella (MR) vaccines, and measles mumps and rubella (MMR) vaccines. MCV global demand has increased since 2012, and is expected to remain high during 2015. MCV demand through UNICEF in 2015 is currently forecasted to reach ~326 million doses, although this amount may increase, particularly as a result of outbreak response requirements.
- In January for 2015, UNICEF awarded an additional 121.8 million doses of MCV (MV and MMR vaccines) increasing supply over and above initial awards of 222 million doses to meet further increases in country requirements for the rest of the year. Based on 2014 data, UNICEF forecast accuracy across MCV was 99%, with actual demand 1% less than forecasted volumes.
- While prices vary between MV, MR and MMR vaccines, all low- and middle-income countries procuring MCV through UNICEF access these vaccines at the same prices irrespective of their per capita income levels, and regardless of the Gavi-eligibility status.
- **For MV vaccine:** 2015 year-to-date (June) estimated MV vaccine requirements could reach up to ~180 million doses in response to routine country demand, outbreak response, and supplementary immunization activities (SIAs). An additional 114.6 million doses were awarded in January 2015 to increase supply from an initial 65 million doses of MV vaccine to meet these requirements.
- In anticipation of 2016-forecast country demand, UNICEF made separate additional awards of 100 million doses of MV vaccine in March 2015, increasing secured supply to 145 million doses from an initial 45 million doses for next year.
- MV vaccine production capacity is sufficient to meet forecasted demand, but is vulnerable with one manufacturer producing ~90% of supply. This manufacturer also produces the only WHO prequalified MR vaccine.
- **For MR vaccine:** UNICEF anticipates 2015 year-to-date (June) MR vaccine country requirements to reach 131 million doses. Although annual supply awarded through UNICEF is sufficient to meet current forecasted demand, UNICEF will work with the manufacturer and countries to ensure that vaccine delivery schedules are accelerated to meet the programmatic requirements.
- **For MMR vaccine:** UNICEF anticipates 2015 year-to-date (June) MMR vaccine country requirements to reach almost 15 million doses. UNICEF awarded an additional 7.2 million doses of MMR vaccine in January 2015 (across Leningrad-Zagreb and Jeryl-Lynn strains); doubling supply from an initial 7 million doses to 14.2 million doses to meet country requirements.
- Whereas MMR vaccine supply containing a Leningrad-Zagreb mumps strain is available in sufficient quantities to meet current forecasted country demand, as of 2014, MMR vaccine containing an Urabe mumps strain is no longer being produced. There is limited availability of the MMR vaccine with a Jeryl-Lynn mumps strain, and is only offered to countries that previously procure this vaccine through UNICEF.

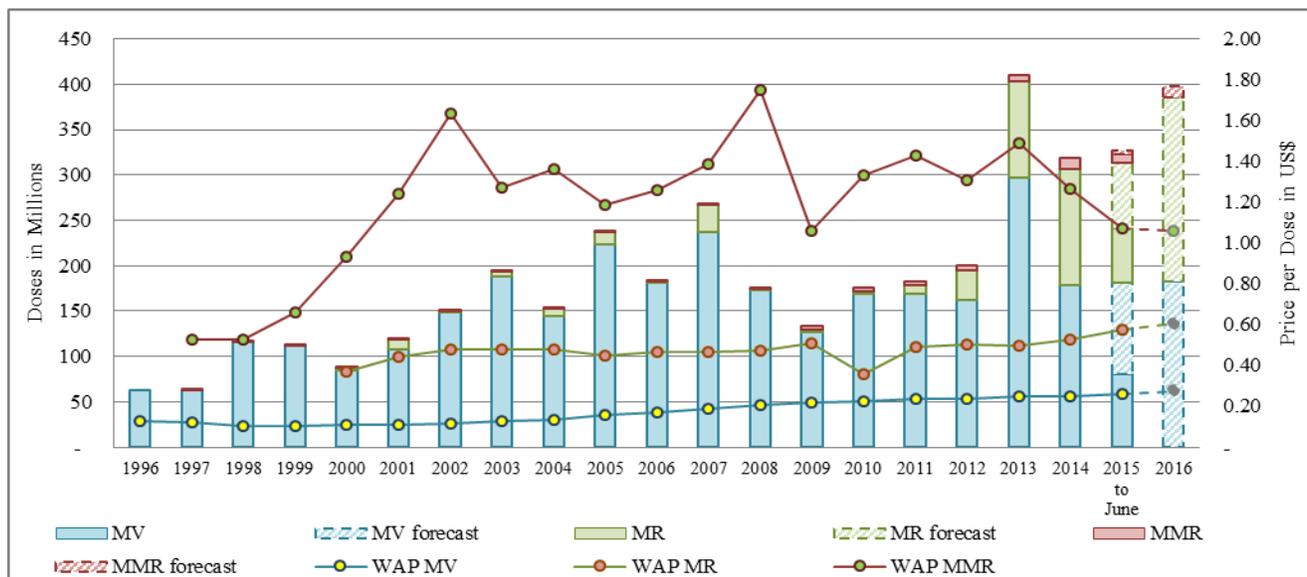
2. General MCV Overview and Background

UNICEF's previous [December 2013](#) and [May 2014](#) MCV Supply Updates provided general market background and updates on changes in 2013 and 2014. Total MCV demand reached 318.8 million doses in 2014. MV vaccine demand accounted for most of the MCV increase, from an original forecast of 116.8 million doses, increasing to reach 179.2 million doses by year-end (56%). Additional demand from large countries, large outbreak responses, and targeting wider age groups of susceptible children with SIAs, accounted for the increase (Figure 1). Some quantities procured in 2014 were delivered for programme implementation during 1Q 2015.

WHO recommends one dose of rubella and two doses of measles vaccine in country routine immunization programmes. The WHO Strategic Advisory Group of Experts on Immunization (SAGE) recommends that:¹

- Countries are to introduce or use a rubella-containing combination vaccine such as MR or MMR vaccines as a first dose measles-containing vaccine. A first dose of MR or MMR vaccines will ensure a higher coverage rate for both rubella and measles.
- Countries that introduce MR or MMR combination vaccines into routine immunization should carry out one-time catch-up campaigns to reach all children between 9 to >15 years of age, according to national epidemiology, to ensure coverage of all susceptible age groups.
- Countries that use different MCVs for their first and second dose measles vaccine should switch to the same combination vaccine (MR or MMR vaccine) for both routine doses.

Figure 1 MCV Supply through UNICEF and Demand Forecast 1996-2016

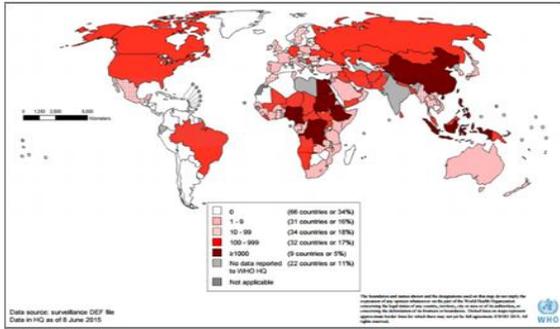


Source: UNICEF Supply Division.

2015 year-to-date (June) MCV vaccine requirements have reached ~326 million doses. UNICEF anticipates potential increases in demand, driven by outbreak response activities and decisions to target a wider age group of susceptible children with SIAs (Figure 1). UNICEF anticipates 2016 MCV demand to reach ~400 million doses to meet existing country requirements, and as a result of forecasted MR vaccine introductions and associated one-time catch-up campaigns. Figure 2 describes the prevalence and onset of measles outbreaks globally over the past six months.

¹ World Health Organization, [Meeting of the Strategic Advisory Group of Experts on Immunization, November 2013: Conclusions and Recommendations](#), WHO, Geneva, January 2014, p.12.

Figure 2 Onset of Measles Outbreaks over the Past Six Months (Nov. 2014 through Apr. 2015)

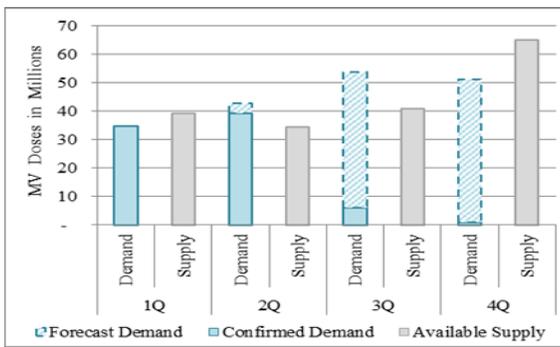


Source: WHO.

UNICEF procurement of MCV for emergency and outbreak response during 2015 year-to-date (June) reached 18.5 million doses for 14 countries (Djibouti, Ethiopia, Guinea-Bissau, Guinea, Kyrgyzstan, Liberia, Mongolia, Niger, Pacific Islands, Sudan and South Sudan). Supply availability is currently sufficient to meet all current emergency and outbreak response requirements.

3. MV Market Situation

Figure 3 UNICEF MV Vaccine Supply Availability and Timing versus Demand Forecast 2015



Source: UNICEF Supply Division.

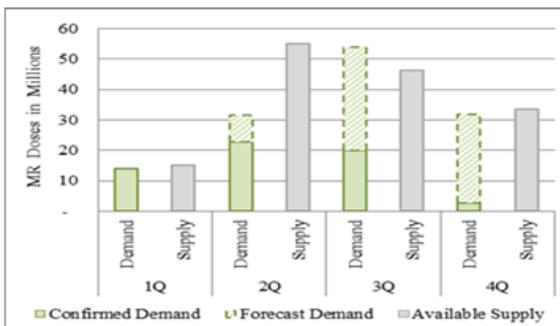
UNICEF has secured availability of ~180 million MV vaccine doses in 2015 year-to-date (June). This is an increase of ~280% on the initial 65 million doses forecasted for 2015. Increased country routine requirements and previously self-procuring countries seeking procurement through UNICEF explain the increase. To meet the additional demand, UNICEF awarded an additional 114.6 million doses in January 2015. Forty-four percent of the demand to date is on purchase order implying that 56% of 2015 demand has yet to be confirmed (Figure 3). UNICEF will review

country requirements later in the year prior to making any additional awards in case some of the updated forecasted demand does not materialise.

4. MR Vaccine Market Situation

Demand for MR vaccine continues to increase. MR vaccine procurement through UNICEF has been on average 7.4 million doses per year from 2000 to 2011. This amount has increased significantly since 2012 through 2013 to reach 126.8 million doses in 2014, primarily due to countries introducing rubella-containing vaccines with support from Gavi, the Vaccine Alliance (Gavi).

Figure 4 UNICEF MR Vaccine Supply Availability and Timing versus Demand Forecast 2015



Source: UNICEF Supply Division.

New country MR vaccine introductions continue to be the main driver for 2015 MR vaccine demand. MR vaccine demand is anticipated to reach ~131 million doses (Figure 4), but these figures are dependent upon Gavi Board funding approvals of country applications for introductions of rubella containing vaccines and associated catch-up campaigns. Aggregate MR vaccine demand will be adjusted and communicated to manufacturers following each round of Gavi Board decisions. UNICEF is working with the manufacturer and countries to facilitate appropriate programme planning and to meet country requirements.

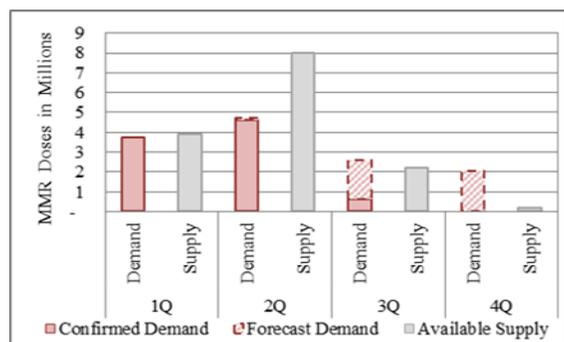
At present, MV and MR vaccines are supplied in 10-dose vials. Some countries have requested supply in a 5-dose vial presentation to reduce wastage. However, 5-dose vials are not supplied by manufacturers on account of finite manufacturing capacity. Filling a 10-dose vial with a 5-dose volume would produce half the manufacturing per-dose volume and would reduce the manufacturer’s capacity to meet total global demand. UNICEF, together with the Measles and Rubella Initiative (MRI) partners, will continue to work with countries to quantify demand for 5-dose vials and will work with manufacturers to secure possible supply of this presentation in the future without jeopardising the overall MCV supply. UNICEF hopes to secure availability of multiple MR presentations by 2017.

The manufacturer that accounts for the majority of global MV vaccine supply also produces the only WHO prequalified MR vaccine. Even though the manufacturer’s MR vaccine production capacity is sufficient to meet all current country requirements, the production facilities for MV and MR vaccines are shared. As a result, any increase in MR vaccine production could affect MV vaccine production capacity and vice versa, requiring accurate forecasting, and careful planning, factoring in adequate lead-times for both products. The WAPs secured by UNICEF in the MV and MR markets have steadily increased over the past 5-10 years (Figure 1) most likely as a result of inflation and the lack of competition in those markets.

5. MMR Vaccine Market Situation

The demand for MMR vaccines through UNICEF is considerably more modest than for MV and MR vaccines, and prices are an order of magnitude greater. Demand is characterized by a predominance of middle-income countries (MICs). These factors mean that there is greater uncertainty compared to other measles-containing vaccines; e.g. in 2014, UNICEF forecasted just 56% of the eventual demand for MMR vaccines that materialized. This was mainly the result of unanticipated demand from MICs that had been expected to self-procure their vaccine requirements.

Figure 5 MMR Vaccine Supply Availability and Timing versus Demand Forecast 2015



Source: UNICEF Supply Division.

UNICEF 2015 year-to-date (June) MMR vaccine award allocations secure 14.3 million-dose availability. Some MMR vaccine availability through UNICEF in terms of the different mumps strains has been reduced.² The MMR vaccine containing an Urabe mumps strain is no longer being produced as of 2014. There is limited availability of MMR vaccine with a Jeryl-Lynn mumps strain. The situation has been exacerbated given a preference by many countries for Jeryl-Lynn-containing MMR vaccine and switches precipitated by the discontinuation of the Urabe-containing MMR

vaccine production. To manage the limited availability of Jeryl-Lynn-containing MMR vaccine, it is only offered to countries that traditionally procure this vaccine through UNICEF. Only MMR vaccine with a Leningrad-Zagreb mumps strain production capacity and supply availability is sufficient to meet all forecasted MMR vaccine country demand requirements, and can meet possible increased demand should this materialise.

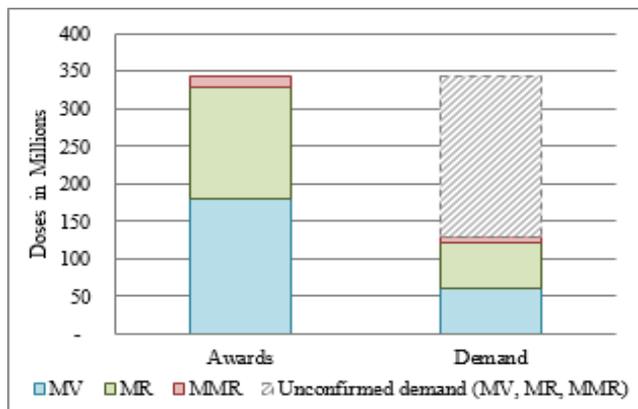
² UNICEF, [Measles, Mumps and Rubella \(MMR\) Vaccine Technical and Supply Information Note](#), UNICEF Supply Division, Copenhagen, January 2015.

6. Aggregate MCV Supply Overview

In aggregate (across MV, MR and MMR vaccines), current MCV award allocations are sufficient to supply all confirmed country requirements of ~149 million doses, which may ultimately reach ~326 million doses, if all demand materialises (Figure 6). MCV country demand forecasts are subject to inaccuracy on account of changing epidemiology, outbreaks, uncertainty over country plans to switch from MV to either MR or MMR vaccines, the influence of unplanned demands from large countries and/or unforecasted demand from some countries that traditionally self-procure. Based on 2014 data, UNICEF forecast accuracy across MCV was 99% (i.e. actual demand 1% less than forecasted volumes).

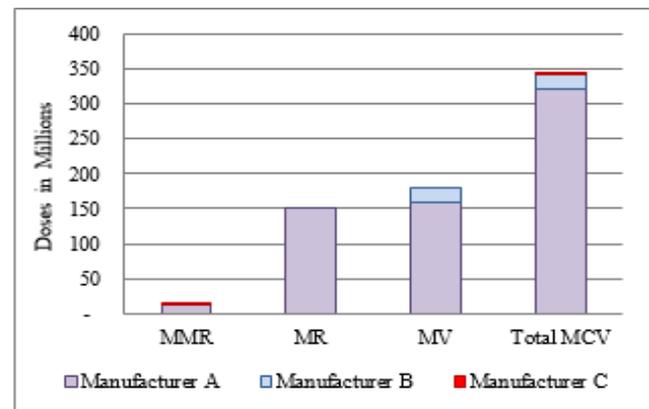
UNICEF's MCV supply is reliant on one manufacturer, which accounts for 94% of total 2015 current supply (Figure 7). While the manufacturer has previously met all demand requirements, such high reliance on a single manufacturer presents a risk to supply security, particularly in an environment characterised by increasing demand. Separately, arrangements are in place to secure a portion of MCV supply ready for shipment within 72 hours for outbreak response.³

Figure 6 Aggregate 2015 MCV Awards



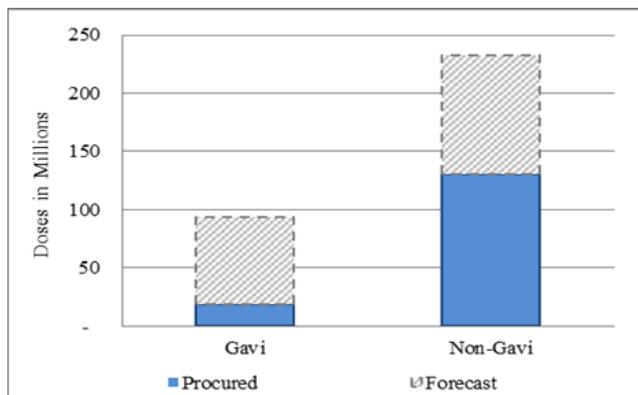
Source: UNICEF Supply Division.

Figure 7 2015 MCV Manufacturer Supply Share



Source: UNICEF Supply Division.

Figure 8 MCV Procurement and Demand for Gavi countries versus Non-Gavi countries in 2015



Source: UNICEF Supply Division.

UNICEF anticipates 2015 year-to-date (June) Gavi-financed country requirements to reach 93 million doses for large-scale catch up campaigns to introduce MR vaccine, measles follow-up campaigns and a measles-containing vaccine second dose (MCV2), of which ~18 million doses have been procured thus far (Figure 8). Gavi-financed country requirements account for ~30% of total MCV demand through UNICEF. Manufacturers do not make any distinction in pricing between Gavi-financed and non-Gavi financed demand. Put another way, all low- and

middle-income countries procuring MCV through UNICEF access these vaccines at the same prices irrespective of their per capita income levels, and regardless of the Gavi-eligibility status.

³ 1 million doses of measles monovalent and 100,000 doses of MR vaccine can be ready for shipment within 72 hours.

7. Issues and Challenges

- Ninety-four percent of MCV supply continues to be sourced from just one manufacturer, perpetuating a fragile supply base. The remaining 6% is shared between two other manufacturers.
- Demand for MCV vaccine supply in 5-dose vials cannot be met at present as it risks reducing manufacturers' 10-dose vial output yield. UNICEF and MRI partners are working with countries to quantify the demand for 5-dose vials and will work with manufacturers to secure the possible availability of this presentation in the future without jeopardising overall MCV supply.
- Total 2015 MCV supply availability depends upon confirmation of country demand for MV and MR vaccines, as both vaccines share the same production facilities. Demand for MV is subject to the persistent threat of measles outbreaks and subsequent campaign-based vaccination response requirements, which may potentially affect planned deliveries. To date, 56% of MV country demand has yet to be confirmed and 55% of country plans for MR vaccine introduction have not yet been approved. MR vaccine introduction is dependent on the Gavi Board's approvals expected end-2Q 2015.
- Despite clear WHO SAGE recommendations for the consistent use of MR or MMR vaccines as a measles-containing vaccine for first and second dose, uncertainty remains in the demand, and some countries' continue using different MCVs for the first and second doses in their schedule.
- Demand for MMR Jeryl-Lynn vaccine as a product preference cannot be met due to limited product availability through UNICEF.

8. Steps Forward

- Countries should communicate confirmation of MCV demand as soon as possible to help UNICEF manage the tight supply availability.
- Gavi Board approvals will determine further financing support and a definitive list of countries that will introduce rubella and MCV2 in 2015, and will provide some visibility into 2016 demand.
- UNICEF will work with manufacturers and countries to ensure that vaccines meet 2015 programmatic requirements. UNICEF may request country flexibility on some vaccine shipments in order to meet the priority needs of some countries.
- UNICEF will work together with programme partners and countries to identify the 5-dose vial quantities required, while ensuring that cost-effectiveness of the presentation selection and cold chain capacity considerations are taken into account. UNICEF will communicate these demand requirements to manufacturers, and work with them to make more appropriate presentations available without jeopardising existing supply availability.
- UNICEF is continuing its efforts with partners and manufacturers through the MRI Supply Coordinating Group to determine more accurate demand forecasts and to reflect these forecasts in future supply contracts.
- UNICEF will continue dialogue with global partners on potential ways to encourage/accelerate new manufacturers into the MCV market and/or to reduce the fragility of the market.
- MCV market dynamics may be subject to rapid change. This note will be updated should there be significant changes to the market.

For further questions or additional information, please contact:

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