

Global Status of MCV2: Time to remove the introduction criterion?



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**SAGE Working Group on Measles & Rubella, Geneva
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Remove MCV2 introduction criterion?

SAGE is requested to consider removing the current criterion for introduction of routine measles second dose (MCV2):

Current criterion stated in the 2009 measles position paper*:

“MCV2 may be added to the routine immunization schedule in countries that have achieved $\geq 80\%$ coverage of MCV1 at the national level for 3 consecutive years as determined by the most accurate means available.”

Outline

- Current policy recommendation and rationale
- Current status of MCV2 introduction
- Rationale for removing the introduction criterion
- Proposed recommendations

Existing WHO recommendations

- **Reaching all children with 2 doses of measles vaccine should be the standard** for all national immunization programmes
 - Second dose through routine services or SIAs
- Minimum interval = one month between doses
- MCV1 at 9 or 12 months
- All unvaccinated children ≥ 12 months should be offered MCV1
- **When MCV1 $\geq 80\%$ for 3 years then add MCV2 at:**
 - 15-18 months (if country has ongoing measles transmission)
 - school entry (an option if near elimination)
- Countries should continue SIAs after routine MCV2 introduction until $>90\text{--}95\%$ immunization coverage has been achieved with both routine doses.
- MCV1 and MCV2 should be recorded on immunization card and register
- School entry screening for vaccination status and catch-up all children lacking 2 doses
- Same vaccine formulation should be used for both MCV2 and MCV1

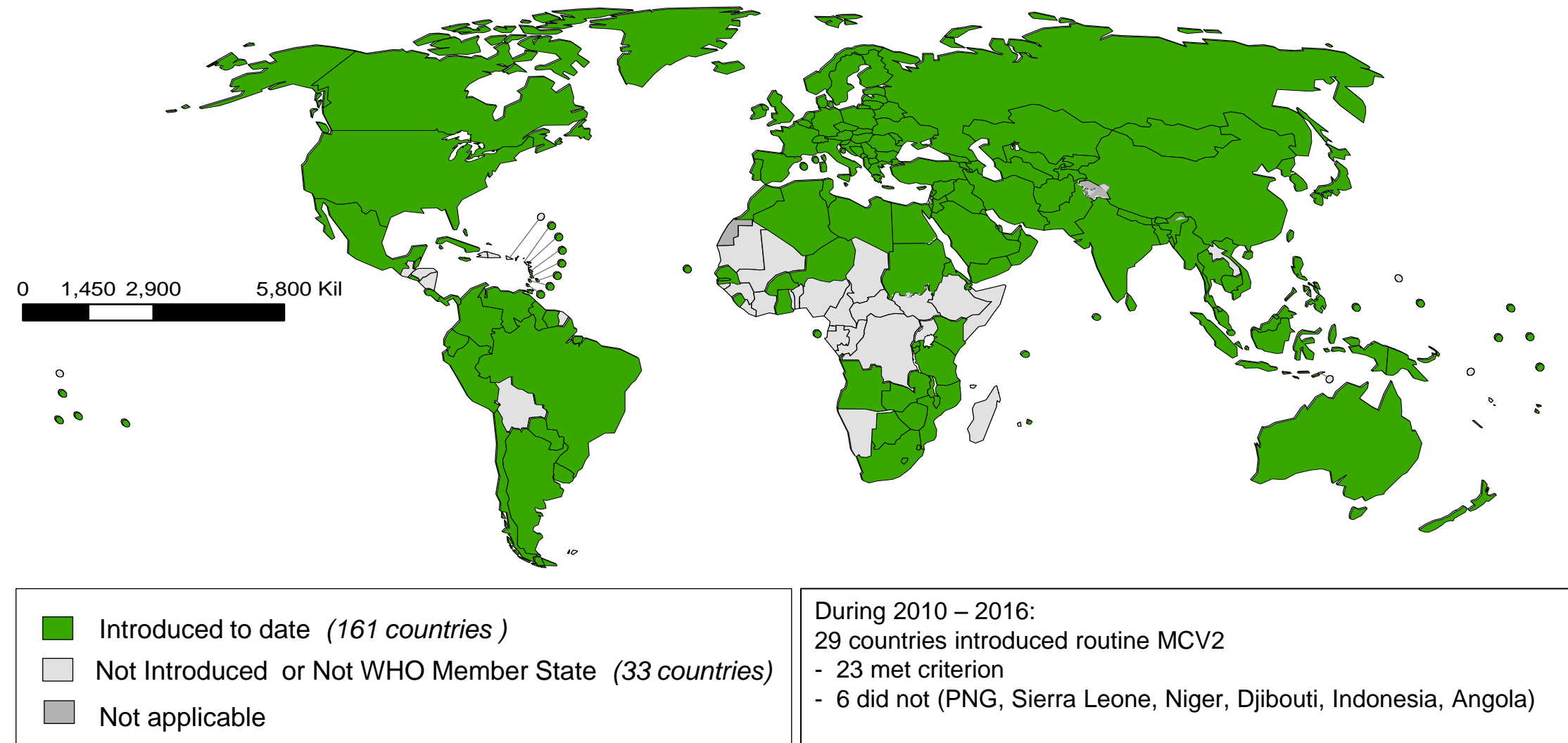


Criterion for MCV2 introduction: Rationale for 2009 SAGE decision

- Concern that routine introduction of MCV2 would distract from efforts to improve MCV1

“In general, countries that do not meet this criterion should prioritize improving MCV1 coverage and conducting high-quality follow-up SIAs, rather than adding MCV2 to their routine schedule.”
- Observation that countries with weaker systems did not reach high MCV2 coverage

Countries using routine measles second dose vaccine, 2016



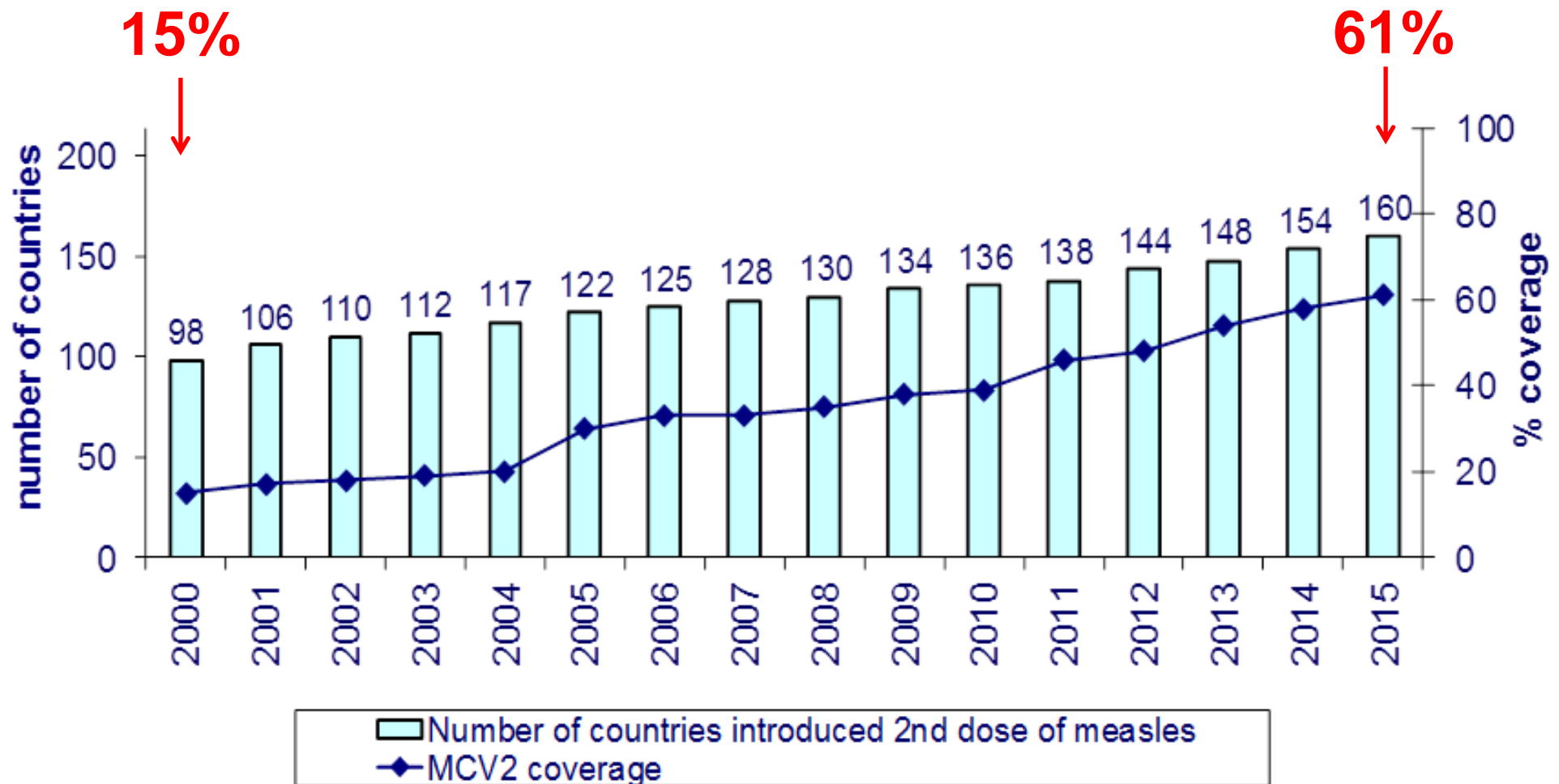
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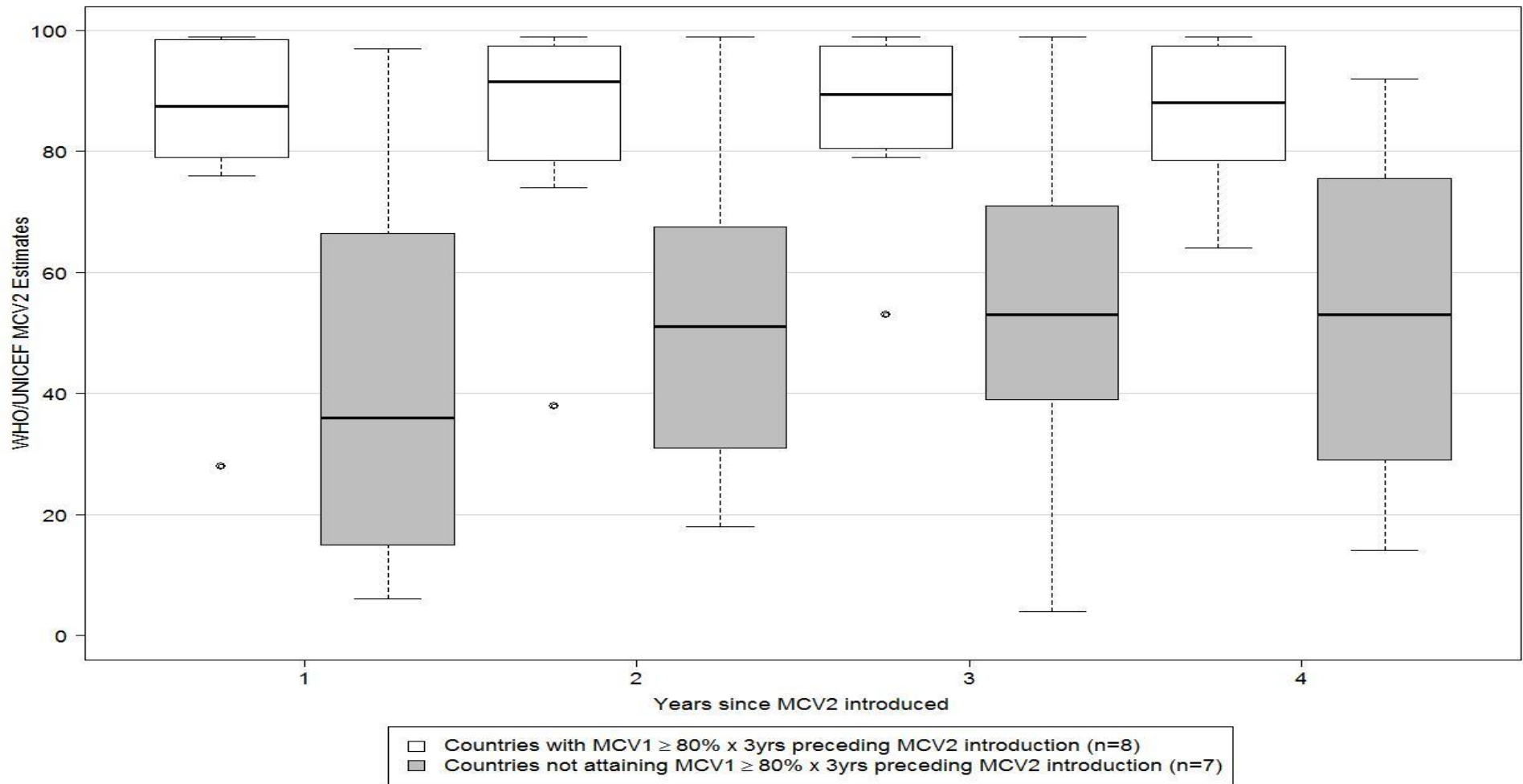


Steady Progress with MCV2, 2000-2015



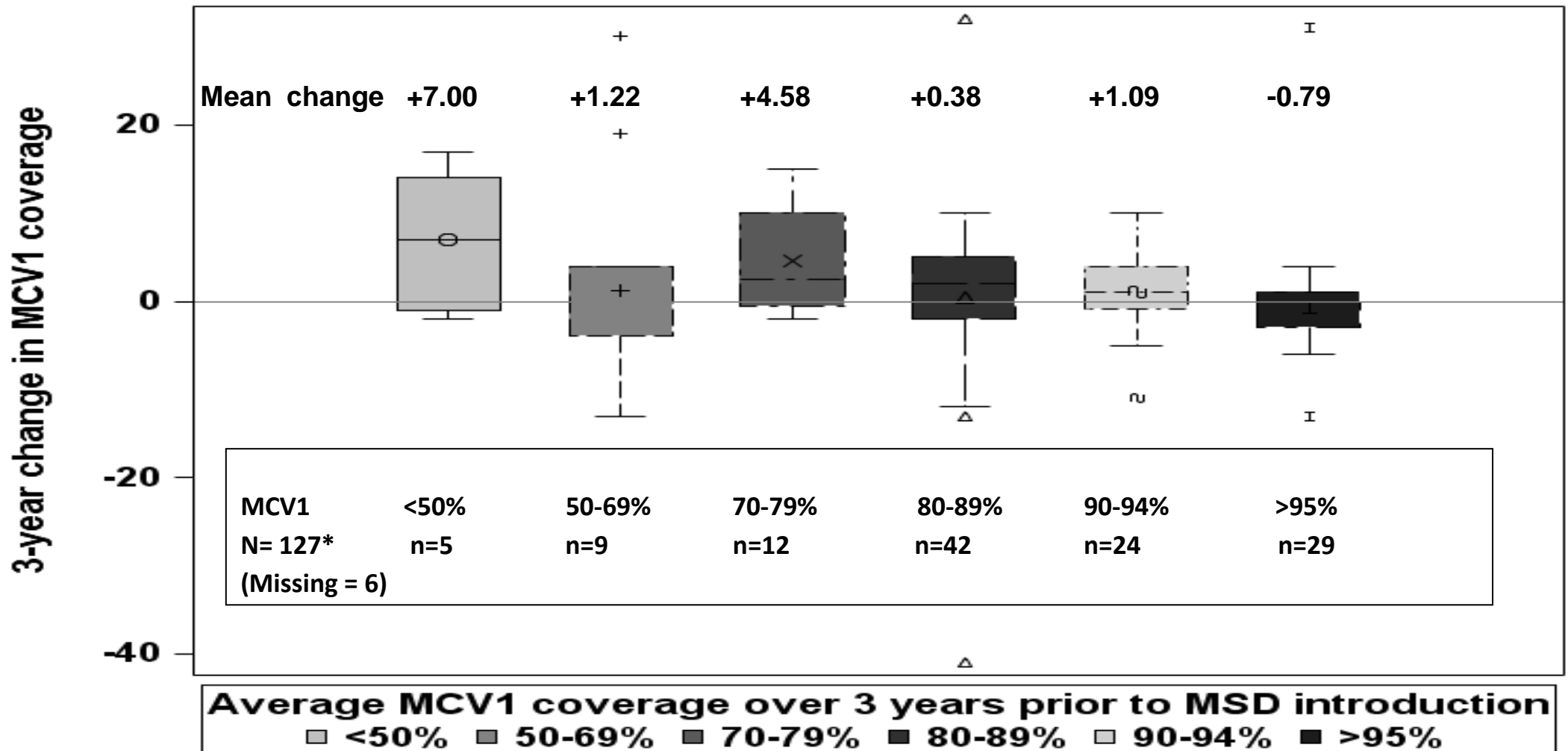
MCV2 coverage lower in countries with weak systems

MCV2 coverage, first four years after introduction (1999-2011),
countries with routine MCV2 in second year of life



MCV1 coverage

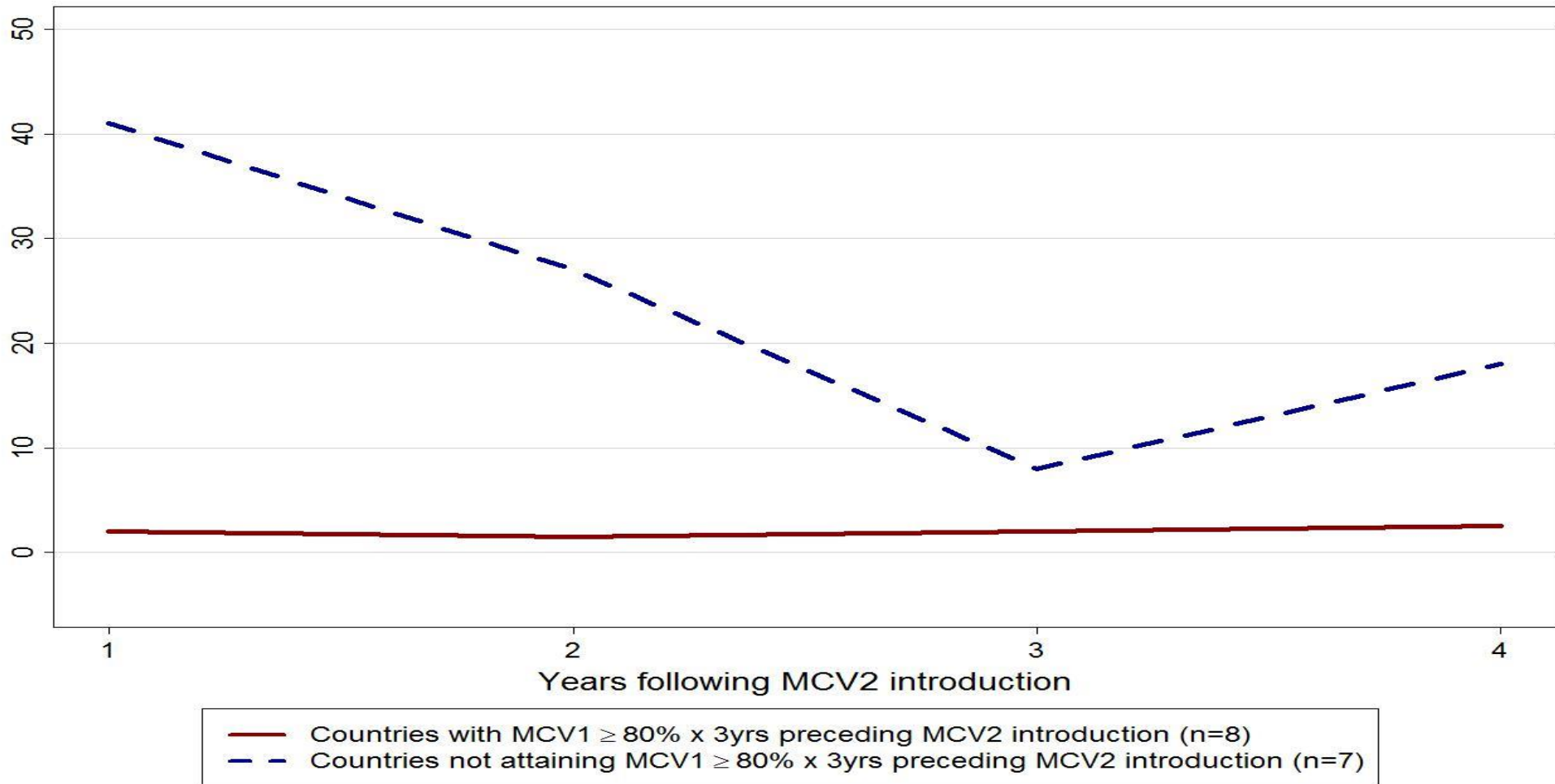
Average change in MCV1 coverage over 3 years post MCV2 introduction, 127 countries, 1981-2012



J.KNP 3.X.2016

Difference between MCV1 and MCV2 rates

Dropout (MCV1-MCV2), Countries with MCV2 in Second Year of Life, Introduction 1999-2011



Rationale for dropping introduction criterion

1. Standardize routine schedules
2. Improve equity in access
3. Reduce barriers to vaccination over 12 months of age
4. Strengthen second year of life (2YL) platform
5. Improve dose recording
6. Reduce MCV wastage

1. Standardize national schedules

- Other WHO vaccination recommendations clearly specify the number of doses required for the primary series (e.g., 3 doses of DTP), irrespective of the delivery strategy
- Delivery strategy options (routine or SIA) sends mixed message about the routine 2-dose schedule (i.e., measles routine vaccination can be a 1-dose schedule where there are SIAs)
- Restrictive criterion creates impression that two doses not needed
 - MCV2 seen as supplemental rather than part of the primary series
- SIAs provide “supplemental doses” usually not counted towards fully immunized child
 - Equivalent to a “second opportunity” rather than a “second dose”

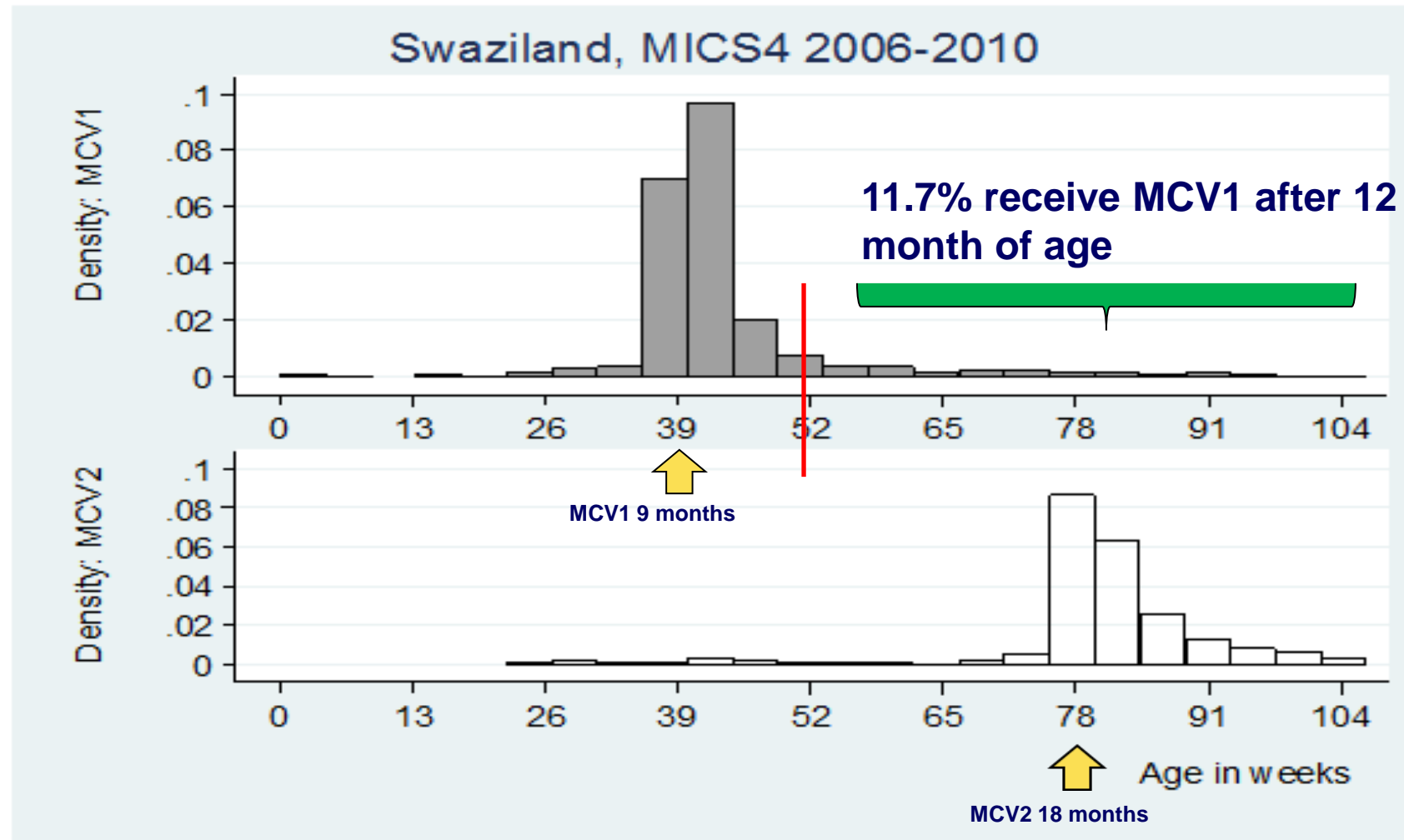
2. Equity in access

- Children born between campaigns do not have equitable access to two doses of measles vaccine in countries without routine MCV2 introduction
- Children who do not seroconvert with MCV1 endure risk for measles infection, particularly with
 - ongoing measles circulation (herd immunity not achieved)
 - long inter-SIA interval (prolonged susceptibility)
 - poor quality SIA (lower than 95% coverage)
- Children who do not receive MCV1 on time are unlikely to receive a late dose and remain unprotected until SIA
- Parents/guardians should have right to access a primary vaccination schedule that provides full individual protection for their children, regardless of when they are born

3. Overcoming barriers to vaccination beyond 12 months of age

- Many developing countries limit vaccination to infants, and do not offer vaccination to children older than 12 months who come late or are missing doses
 - Fear of vaccine stock out
 - Lack of knowledge about the need to provide measles vaccination to any non-immune person, irrespective of their age
- MCV2 in the second year of life signals to health workers that vaccinating beyond 12 months of age is indicated and good practice

Routine MCV2 can increase delivery of MCV1 after 12 months of age



4. Building a second year of life platform

- At the April 2016 meeting*, “SAGE strongly endorsed the importance of a fixed 2YL...”
- MCV2 contact helps build second year of life platform
 - Delivering other vaccines (e.g., MenA, PCV if using a 2+1 alternative schedule, DTP4 booster doses)
- MCV2 contact helps catching up missed vaccination doses and fully immunized child (FIC) coverage

* WER. No 21, 2016, 91, p. 265–284

5. Improve recording of doses

- WHO recommends recording and monitoring the administration of both doses, including those delivered through SIAs
 - Only PAHO and EUR countries record SIA doses
 - Incomplete record of MCV doses received in many countries
- It is important to accurately know number of doses received
 - Assess immunity status of individual
 - Case investigation
 - Generation of population immunity profiles
- Recommending a two-dose routine schedule for all countries (without any criteria) would globally standardize the recording of at least two doses

6. Reduce MCV Wastage

- Wastage for 1-dose MCV schedule 45-60%
 - 10-dose measles vial
 - Multi-dose vial policy
- MCV2 introduction may reduce wastage by 40%

| Vial size | For 1 dose schedule | | For 2 dose schedule | |
|---------------|------------------------|--------------------------|------------------------|--------------------------|
| | Estimated wastage rate | Estimated wastage factor | Estimated wastage rate | Estimated wastage factor |
| Single dose | <5% | 1.05 | <5% | 1.05 |
| 5 doses/vial | 30–40% | 1.43–1.67 | 15–25% | 1.18–1.33 |
| 10 doses/vial | 45–60% | 1.82–2.50 | 25–35% | 1.33–1.54 |

- Experience comparing 1 dose YF vs 2 dose MCV
 - Niger: 15.2% vs 9.0% (40% difference)
 - Senegal: 27.1% vs 10.2% (62% difference)
- May increase MCV1 coverage by reducing hesitation to open vials

Proposed recommendations (1)

1. MCV2 should be added to national immunization schedules in all countries regardless of MCV1 coverage.
2. Accumulation of susceptible persons should continue to be monitored subsequent to routine MCV2 introduction and a follow-up SIA conducted whenever the number of susceptible pre-school age children approaches the size of a birth cohort. Furthermore, subnational coverage data should be monitored for the unequal accumulation of susceptible children, indicating equity gaps.

Proposed recommendations (2)

3. Routine MCV2 can serve to establish a well-child visit in the second year of life and provide a timely opportunity to catch-up children who missed MCV1. The first dose of MCV received by a child 9 months or older should be recorded as MCV1 in the child's health records. A Dose received at least one month after the first dose, should be recorded as MCV2.

Question to SAGE

1. Does SAGE endorse the Measles-Rubella Working Group's proposed recommendation that the criterion for MCV2 introduction be removed?
2. Does SAGE endorse the MR WG's proposed recommendation that two doses of MCV be included in national immunization schedules?

[illegible]

EXTRA SLIDES

WHO Measles Vaccine Position Paper, 2009*

“Reaching all children with 2 doses of measles vaccine should be the standard for all national immunization programmes.”

...

“MCV2 may be added to the routine immunization schedule in countries that have achieved $\geq 80\%$ coverage of MCV1 at the national level for 3 consecutive years as determined by the most accurate means available. In general, countries that do not meet this criterion should prioritize improving MCV1 coverage and conducting high-quality follow-up SIAs, rather than adding MCV2 to their routine schedule.”

Existing recommendations

WHO Measles Vaccine Position Paper, 2009*

- “The cessation of SIAs should be considered only when **>90-95%** immunization coverage has been achieved at the national level for **both MCV1 and routine MCV2** for a period of at least **3 consecutive years**”.
- “Irrespective of the strategy or schedule followed, **both MCV1 and MCV2 should be recorded on a child’s immunization card** and in a clinic’s vaccination register. Children should be screened for their measles vaccination history at the time of school entry, and those lacking evidence of receipt of 2 doses should be vaccinated.”



Existing recommendations

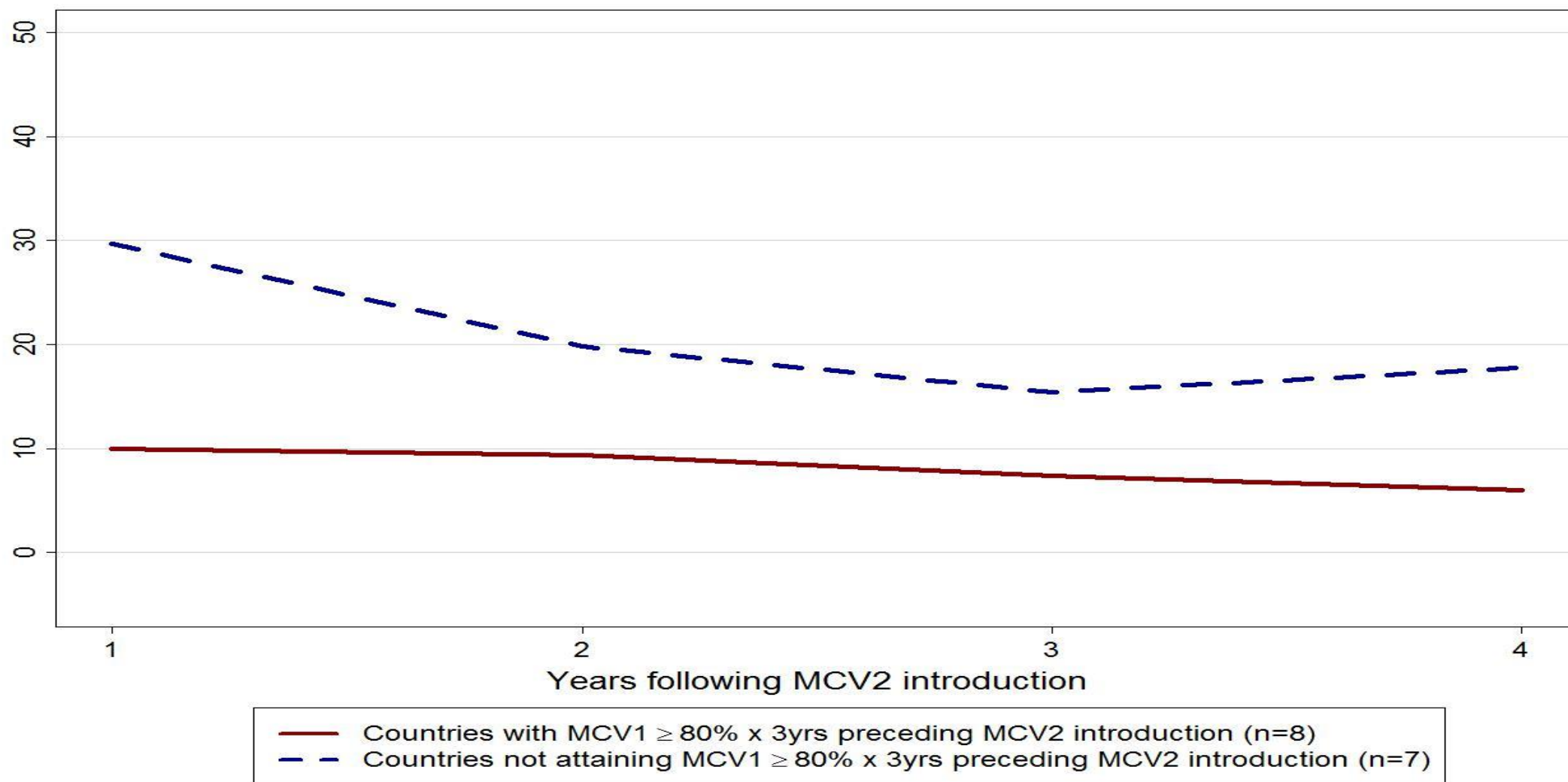
WHO Measles Vaccine Position Paper, 2009*

“Countries with ongoing measles transmission and MCV1 delivered at age 9 months should administer the routine dose of MCV2 at age 15–18 months. The minimum interval between MCV1 and MCV2 is 1 month. Providing routine MCV2 to children in their second year of life reduces the rate of accumulation of susceptible children and the risk of an outbreak. In countries with low measles transmission (that is, those that are near elimination) and where MCV1 is administered at age 12 months, the optimal age for delivering routine MCV2 is based on programmatic considerations that achieve the highest coverage of MCV2 and, hence, the highest population immunity. Administration of MCV2 at age 15–18 months ensures early protection of the individual, slows accumulation of susceptible young children and may correspond with other routine immunizations (for example, a DTP booster). If MCV1 coverage is high (>90%) and school enrolment is high (>95%), administration of routine MCV2 at school entry may prove an effective strategy for achieving high coverage and preventing outbreaks in schools.”

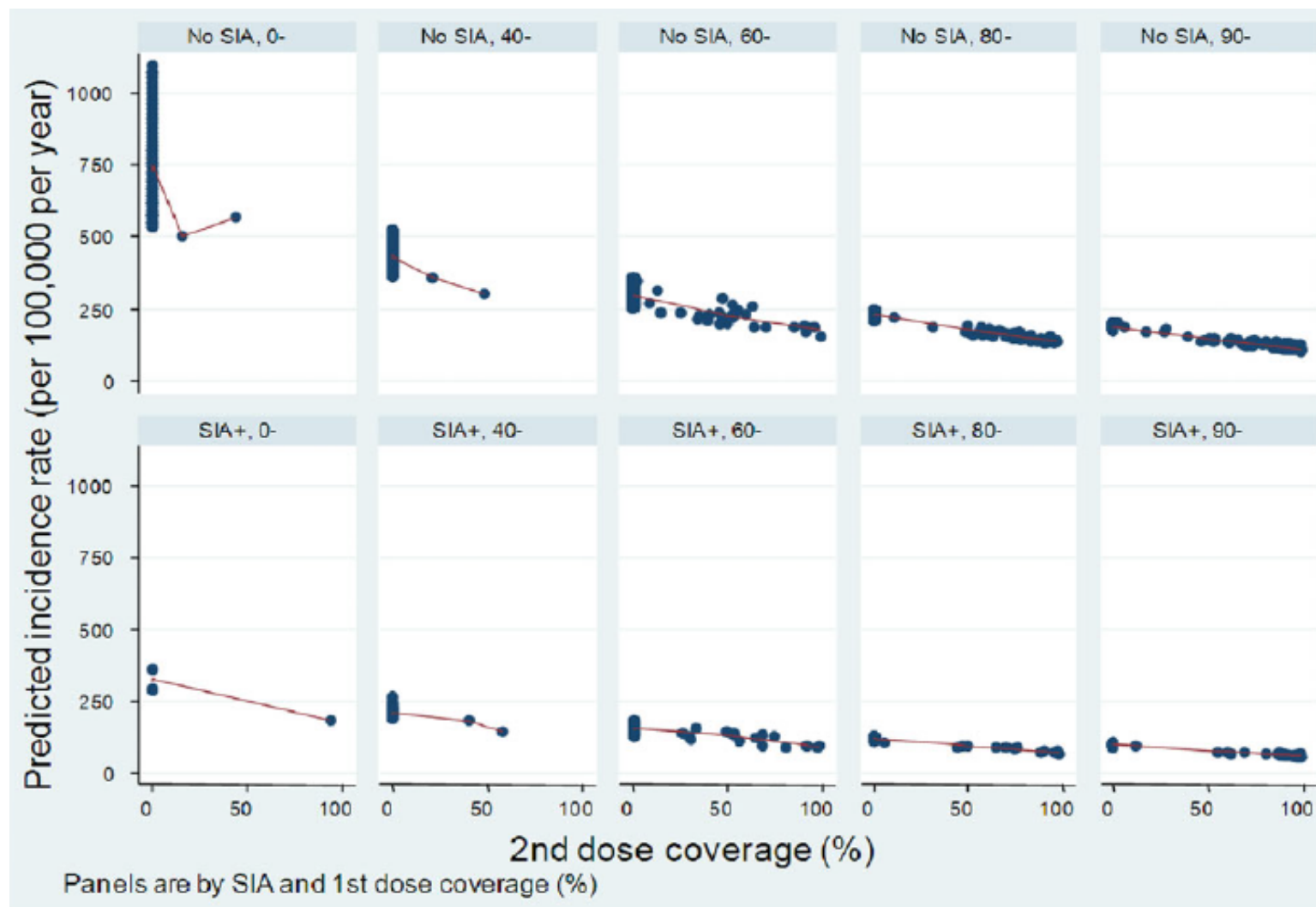


Mean difference between MCV1 and MCV2 rates

Dropout (MCV1-MCV2), Countries with MCV2 in Second Year of Life, Introduction 1999-2011



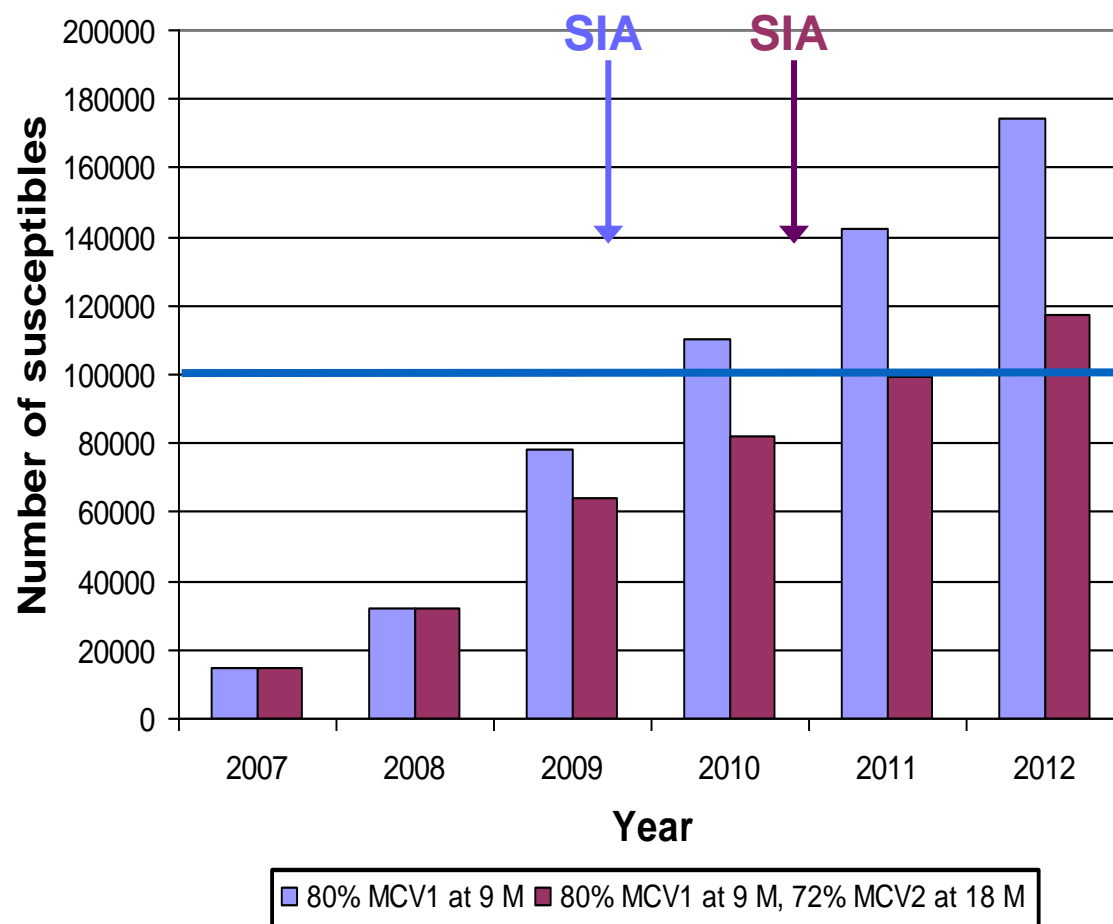
MSD reduces measles incidence when MCV1 <80%



↑ 1% MCV2
↓ 0.4% measles incidence

Negative binomial regression model
JRF data 1980-2008

Routine MCV2 slows accumulation of susceptibles and lengthens period between SIAs



- Hypothetical birth cohorts of 100,000

- Assume:

- Catch-up in 2006 with 90% coverage

- 25% of unvaccinated children will receive MCV2

Source: E Simons, WHO/IVB (spreadsheet analysis)