**National Advisory Group on Immunisations (NAGI)**
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15 April 2025

**The Ministry of Health, Republic of South Africa**
**Office of the Minister**

**SUBJECT: RECOMMENDATION FOR A CATCH-UP DOSE OF MEASLES-RUBELLA CONTAINING VACCINE (MRCV) TO CHILDREN AT 9 YEARS OF AGE, AS PART OF THE INTEGRATED SCHOOL HEALTH PROGRAMME (ISHP), FOR 9 YEARS AFTER INTRODUCTION**

Dear Honorable Dr Motsoaledi

In line with a previous NAGI recommendation (dated 23 March 2022), the National Department of Health (NDOH) has included measles-rubella containing vaccine (MRCV) in the Expanded Programme on Immunisation (EPI) in 2024, to support the global measles-rubella (MR) elimination strategy. The World Health Organization (WHO) has demonstrated through modelling that a wide age-ranging supplementary immunisation activity (SIA) to be implemented at or before introduction of MRCV will prevent a paradoxical increase in congenital rubella syndrome (CRS)[1]. This latter public health problem may occur when low vaccination coverage with MRCV leaves a proportion of the population susceptible to rubella but simultaneously reduces circulation of the rubella virus. This leads to wider time intervals between rubella outbreaks. Susceptible persons, who have not received vaccination may be older when the next rubella outbreak(s) occur. This phenomenon occurred across multiple countries in Europe and South America in the 1970's-1990's[2], and is observed with current WHO data[3]. As the average age of acute rubella cases rises, the risk of infection during pregnancy rises, thus increasing CRS risk[4]. In some countries, an increase in CRS was noted, in some cases to pre-vaccination levels[5,6,2].

## PROBLEM STATEMENT

**Closing the rubella immunity gap to prevent a paradoxical increase in CRS after introduction of rubella vaccine into the EPI programme.**

The NDOH advised provinces to introduce MRCV at two time points in the childhood EPI (6 and 12 months). This has been implemented over the course of 2024. Modelled and emerging evidence

suggest that elimination of rubella and burden reduction of CRS are possible when a SIA targeting males and females 15 years and younger is combined with the introduction of rubella vaccine into the EPI programme[1,7]. This SIA at the point of introduction of the rubella vaccine closes any immunity gap in children too old to receive MRCV after introduction into the EPI by ensuring that the existing cohort of children under 15 years of age are all immune to rubella, and that female members of this cohort will enter reproductive age immune from rubella infection. A SIA will only close the rubella immunity gap if it achieves sufficiently high vaccine coverage. NAGI has considered the options for closing the rubella immunity gap amongst children and makes its recommendations.

## FACTORS CONSIDERED

### I) Current and historic rubella immunity gap

Data extracted from routine National Health Laboratory Services (NHLS) rubella IgG serology tests since 2013 (Annex, Figure 1), and seroprevalence studies conducted on ante-natal sera suggest that over 90% of South African women 18 years and older exhibit anti-rubella IgG[8]. During the current rubella outbreak (commencing September 2024) and every year prior to this since 2015, most acute rubella cases occur in the 0-4 and 5–9-year age groups (Annex, Table 1 & Figure 2). These data demonstrate that the largest rubella immunity gaps are likely present in the 0-4 and 5-9-year age groups.

### II) Measles coverage

National measles coverage over the last five years (2019-2023) is below the desired community (herd) immunity threshold of 95%, with current measles vaccination coverage (MCV1 and 2) estimated at 80% and 84% respectively (see footnote[1]). WHO advocates a planned SIA where coverage is below the threshold at intervals ranging from 4-5 years depending on vaccination coverage[9]. These planned SIAs should be conducted with measles-rubella (MR) vaccine. As South Africa has been unable to meet the vaccination coverage target, it is anticipated that planned or reactive SIAs with combined MR vaccine will be required. Although these SIAs will be initiated in response to epidemiological and vaccination data pertaining to measles, they will strengthen population-level rubella immunity.

[1] https://immunizationdata.who.int/dashboard/regions/african-region/ZAF, accessed 28 January 2025

## III) Measles SIAs in South Africa

The recent measles outbreak (October 2022-March 2023) necessitated a reactive SIA that was conducted between March-April 2023, targeting children 15 years and under. An estimated coverage of 54%[7] was reported. SIAs that are conducted in a reactive way in response to outbreaks are less desirable as they disrupt routine service delivery in an unplanned manner[10,11]. Further, without adequate planning, it is difficult to achieve high coverage, or high-quality interventions.

## IV) Integrated School Health Programme

SA administers tetanus, diphtheria and acellular pertussis (TdaP) to girls and boys aged 9 years and human papillomavirus (HPV) vaccine to girls aged 9 years through the Integrated School Health Programme (ISHP). Every year, a vaccination campaign for these children complements the health services already described and offered[12]. Data provided by the NDOH for round 1, 2024 indicates that over 95% of schools are reached, and over 80% of learners vaccinated (Annex, Table 2). Challenges in the ISHP do exist including funding, returning of signed consent forms by parents, and logistics. However the programme has been evaluated and strengthening of the programme is underway[13].

## V) Modelling

Motaze *et al* modelled the impact of RCV introduction in South Africa on the incidence of CRS using a variety of scenarios, and determined time to elimination and the relative costs to achieve CRS reduction[14] (see footnote for assumptions[2]). One scenario, namely the introduction of RCV into the same age group (9 years) as the HPV vaccine through the ISHP is informative: the lowest modelled RCV cost per CRS case averted for a similar percentage of CRS reduction was achieved when routine vaccination at 12 months was followed by another vaccination at 9 years. It should be noted that this scenario did take 3-5 years longer to eliminate CRS compared with other model scenarios that included wide age-ranging SIA at or before inclusion of rubella vaccine into routine EPI services.

[2] Model assumptions were as follows: a single rubella vaccine administered at 12 months of age, no additional costs incurred by including rubella in an existing school immunisation programme, and SIAs triggered only because of rubella immunity requirements (i.e. not factoring measles elimination goals or combined administration of measles with rubella vaccine). The model did not consider CRS cases or costs amongst the susceptible children in the 9–15-year age category. It also neglected population heterogenicity in fertility rates, sub-regional differences in Re and population mobility

In summary, it appears that:

- a wide age-ranging SIA with MRCV may not fully close the rubella immunity gap that emerges after introduction of MRCV because of difficulty in achieving sufficiently high coverage;
- immunisation for HPV and TdaP through the ISHP has consistently achieved high coverage rates of 9-year-old children;
- as all cost implications were not considered, the modelling could not demonstrate the additional cost of administering a dose of MRCV to 9-year-olds to achieve elimination of CRS.

## RECOMMENDATIONS

*NAGI recommends that primary immunisation with MRCV of infants at 6 and 12 months of age be accompanied by a catch-up dose of MRCV administered as part of the ISHP to all 9-year-old children of age who attend public, private and special schools for a period of 9 years following the introduction of MRCV.*

NAGI has identified key conditions that the Department should strive to reach, to ensure that this recommendation prevents an increase in CRS cases in the years following MRCV introduction; namely

- Where necessary, and through appropriate means, the ISHP should be strengthened;
- The NDOH, provincial health departments and the National Institute of Communicable Diseases (NICD) must strengthen surveillance and data collection on the number and outcome of CRS cases;
- Provinces should strengthen monitoring and evaluation of MRCV coverage during the EPI and ISHP;
- Provinces should monitor the impact of the inclusion of MRCV in the ISHP especially the added service requirements and costs;
- Provinces should strengthen pharmacovigilance activities following introduction of MRCV by including training of vaccinators, health service providers about adverse events following immunisation (AEFI) and how to report them, and by creating awareness amongst vaccinees, parents and teachers about AEFI.

## RATIONALE FOR THE RECOMMENDATION

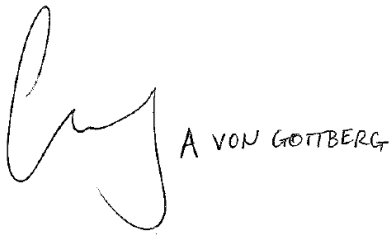
Including a third dose of MRCV in the school health programme to children 9 years of age from the time of inclusion of MRCV into the EPI programme (2025) and for a period of 9 years

afterwards (2034) will reduce the number of rubella-susceptible women entering childbearing age and will contribute to the elimination of CRS.

The benefits of adding MRCV to the vaccines administered through the ISHP include a likely higher vaccination coverage compared with a disruptive SIA targeting all children aged 1-15 years, and lower economic, social and educational costs that arise through shared expenses with the existing ISHP and fewer educational and health service disruptions.

Thank you for your consideration.

Yours sincerely,

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**CC: Dr S Buthelezi (Director-General)**

**Mr Morewane (Acting Deputy Director-General: HIV, TB and MCWH)**

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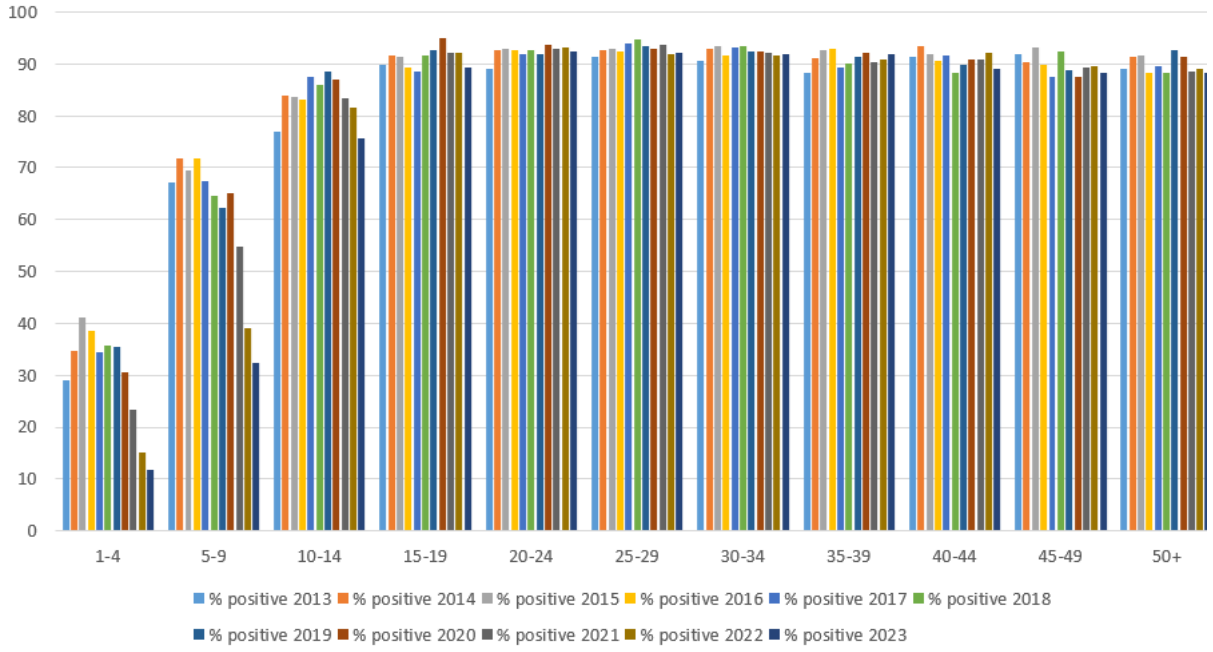


**Figure 1.** The proportion of blood tests submitted to the NHLS and NICD from 2013-2023 that test positive for IgG antibodies against rubella. (Data source: NICD Surveillance Data Warehouse; analysis by U. Makongo for Centre for Vaccines and Immunology, NICD, November 2023)

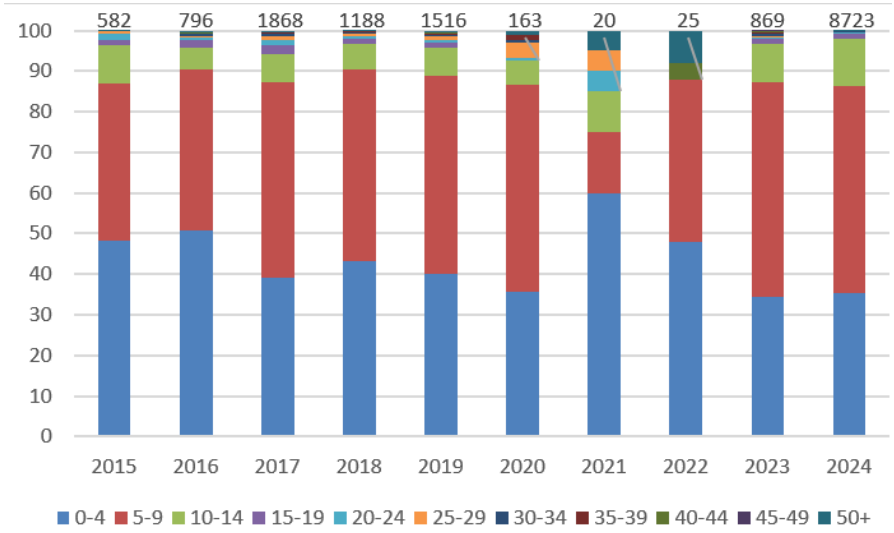


**Figure 2.** The proportion of rubella cases by 5-year age category for 2015-2024 as identified from fever-rash surveillance conducted by the NICD. Data and figure courtesy Centre for Vaccines and Immunology, NICD. The number on the outside end of each bar represents the number of IgM positive rubella cases identified each year since 2015, and the size of each coloured segment is the proportion of IgM positive cases in that age category. *2024 data is included only up to week 40.

**Table 1.** The distribution (including the number and % of annual cases) of laboratory confirmed rubella infections by age group from 2015-2024. (data courtesy NICD/Centre for Vaccines and Immunology). *2024 data is included only up to week 40.

| | Year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **AGE GROUP** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| 0-4 | 280 (48) | 403 (51) | 733 (39) | 514 (43) | 606 (40) | 58 (36) | 12 (60) | 12 (48) | 300 (35) | 3137 (34) |
| 5-9 | 226 (39) | 317 (40) | 895 (48) | 561 (47) | 740 (49) | 83 (51) | 3 (15) | 10 (40) | 457 (53) | 4643 (51) |
| 10-14 | 55 (9) | 43 (5) | 134 (7) | 72 (6) | 106 (7) | 10 (6) | 2 (10) | 0 (0) | 84 (10) | 1051 (11) |
| 15-19 | 8 (1) | 15 (2) | 41 (2) | 15 (1) | 17 (1) | 0 (0) | 0 (0) | 0 (0) | 10 (1) | 108 (1) |
| 20-24 | 8 (1) | 5 (1) | 22 (1) | 9 (1) | 13 (1) | 1 (1) | 1 (5) | 0 (0) | 2 (0) | 34 (0) |
| 25-29 | 4 (1) | 2 (0) | 18 (1) | 9 (1) | 14 (1) | 6 (4) | 1 (5) | 0 (0) | 5 (1) | 16 (0) |
| 30-34 | 0 (0) | 5 (1) | 11 (1) | 3 (0) | 5 (0) | 1 (1) | 0 (0) | 0 (0) | 5 (1) | 12 (0) |
| 35-39 | 0 (0) | 0 (0) | 4 (0) | 3 (0) | 5 (0) | 2 (1) | 0 (0) | 0 (0) | 3 (0) | 6 (0) |
| 40-44 | 0 (0) | 1 (0) | 2 (0) | 0 (0) | 4 (0) | 0 (0) | 0 (0) | 1 (4) | 2 (0) | 0 (0) |
| 45-49 | 0 (0) | 0 (0) | 2 (0) | 1 (0) | 1 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (0) | 1 (0) |
| 50+ | 1 (0) | 5 (1) | 6 (0) | 1 (0) | 5 (0) | 2 (1) | 1 (5) | 2 (8) | 0 (0) | 11 (0) |
| **Total** | **582** | **796** | **1868** | **1188** | **1516** | **163** | **20** | **25** | **869** | **9019** |

**Table 2**. The number, and coverage of schoolgirls aged 9 years and older vaccinated (left) and schools (right) reached by the Integrated School Health Programme, round 1, 2024 with the human papilloma virus (HPV)

| 1. Grade five (5) schoolgirl learners aged 9 years and older vaccinated for HPV Round 1 of Feb/Mar 2024 | | | | 2. Schools with grade five (5) girl learners reached by the HPV vaccination teams during the Round 1 of Feb/Mar 2024 | | |
|---|---|---|---|---|---|---|
| Province | Grade 5 girl learners | Learners vaccinated | Coverage | No. of schools | Schools reached | Coverage |
| EC | 61 251 | 56 256 | 91.8% | 4 037 | 3 763 | 93% |
| FS | 26 972 | 24 169 | 89.6% | 634 | 633 | 99.8% |
| GP | 77 097 | 62 793 | 81.4% | 1 492 | 1 446 | 96.9% |
| KZN | 100 436 | 94 970 | 94.6% | 4 045 | 4 045 | 100% |
| LP | 64 794 | 61 675 | 95.2% | 2 313 | 2 313 | 100% |
| MP | 41 640 | 38 387 | 92.2% | 1 103 | 1 103 | 100% |
| NW | 33 269 | 29 569 | 88.9% | 1 038 | 1 031 | 99.3% |
| NC | 11 200 | 8 959 | 80.0% | 404 | 396 | 99.3% |
| WC | 47 997 | 40 791 | 85.0% | 1 112 | 1 110 | 85.0% |
| **NATIONAL** | **457 585** | **405 299** | **88.6%** | **16 178** | **15 840** | **97.9%** |