

Report: Rubella in South Africa, 2024

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Produced by the Centre for Vaccines and Immunology

National Institute for Communicable Diseases

The NICD conducts serological testing for measles and rubella on blood samples submitted by clinicians across the country as part of fever-rash surveillance. Clinicians submit blood for testing on persons who meet the case definition as follows: a suspected case of measles or rubella includes any person of any age who presents with a fever and a maculo-papular rash, and any of conjunctivitis, coryza (runny nose) and cough.

Current epidemiological description of rubella cases in South Africa, 2024

The NICD has been inundated with fever-rash samples for testing, and it is evident that there is a marked increase in rubella cases across the country (Figure 1). Over 8,700 IgM positive cases have been identified up until week 40. To date 98% (8543/8723) of cases have occurred in children under 15 years of age, with the bulk occurring in the 5-9 year age group (Table 1 and Figure 2). The number of cases in 2024 is exceeding the number of rubella cases identified through fever-rash surveillance cases since 2015 (Figure 3). The number of samples and proportion testing positive by province is shown in Table 2 below. Delays in procurement of testing kits has lead to a delay in sample testing. Presently an estimated 6,000 samples are awaiting testing, including samples from week 40 (commencing 29 September 2024) onwards. Whilst a seasonal increase in rubella cases is expected every year, usually occurring from September to December each year, the number of cases is much larger in 2024 compared with previous years (Table 1, Figure 2 and Figure 3).

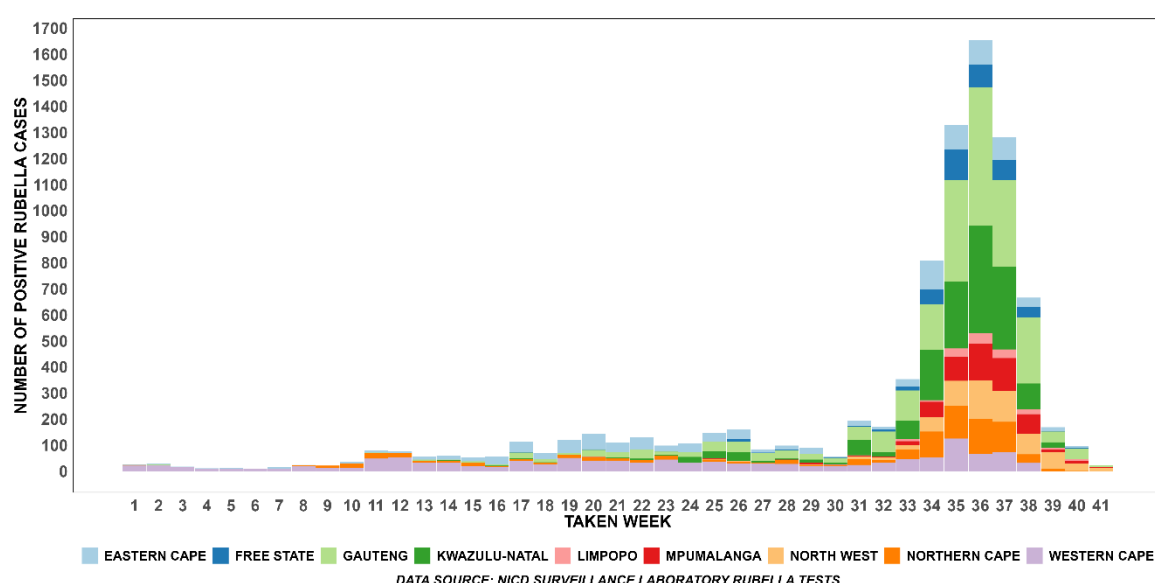


Figure 1. Number of laboratory-confirmed rubella cases by epidemiological week of 2024. Because of the backlog due to delay in test kits, test results from week 39 onwards are likely to increase

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

AGE GRO UP	Year									
	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

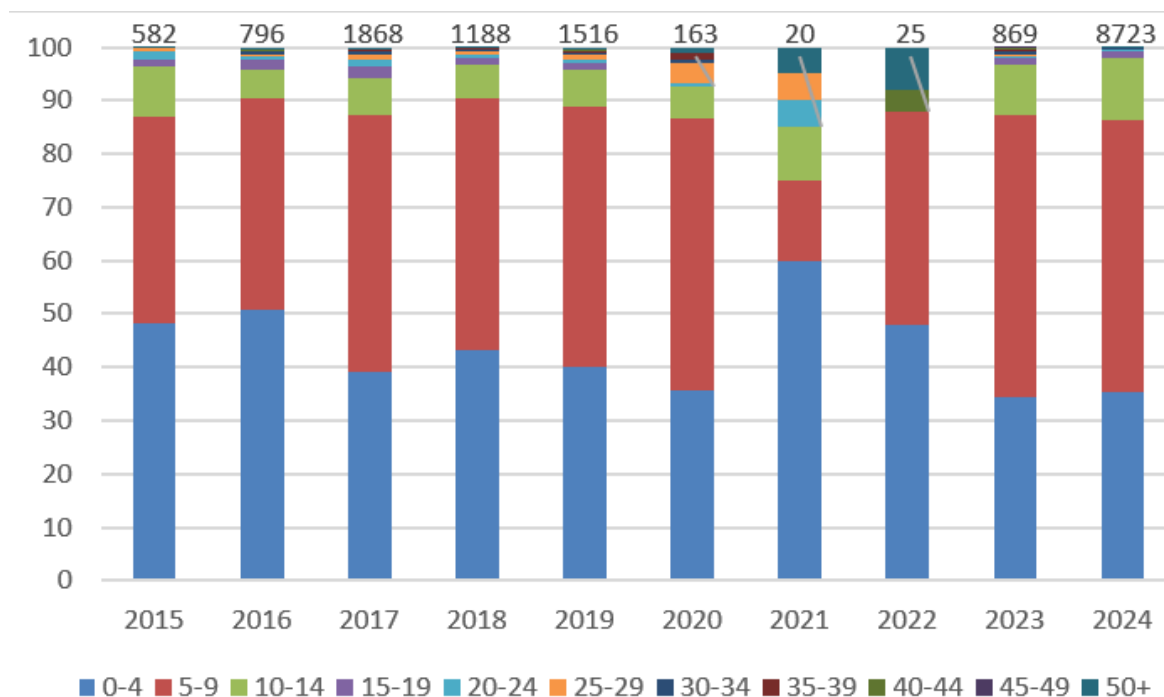


Figure 2. The proportion of cases by 5-year age category for 2015-2024. The number on the outside end of each bar represents the number of IgM positive rubella cases identified

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.

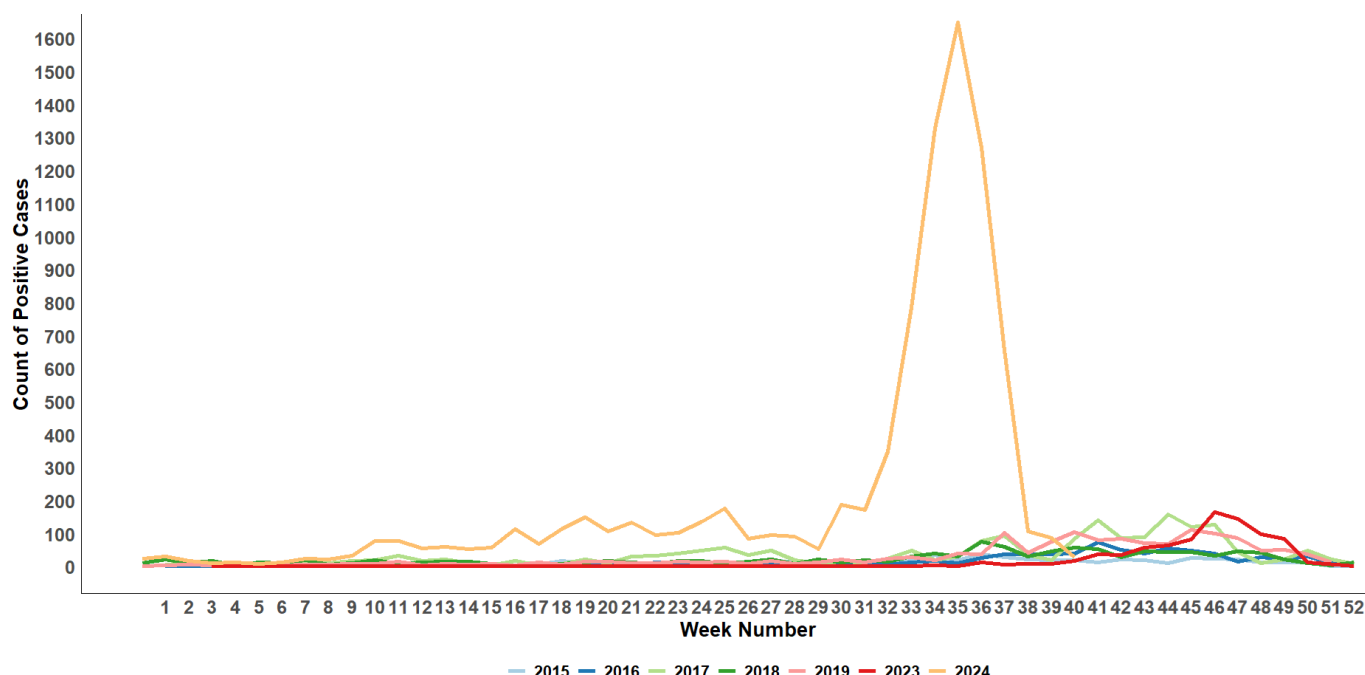


Figure 3. Number of laboratory-confirmed rubella cases by epidemiological week of 2015-2024, omitting the years 2020-2022. *2024 data is included only up to week 41. The years 2020,2021 and 2022 are omitted from this figure as the total numbers of laboratory-confirmed cases during these years are 126, 20 and 25 cases respectively.

Table 2. The distribution of positive cases by province for 2024 up to week 40 (commencing 29 September 2024).

	EC	FS	GP	KZN	LP	MP	NW	NC	WC	South Africa
IgM positive for rubella	1061	433	2406	1622	158	594	686	800	1262	9022
Total submitted for rubella testing	1802	746	4480	2505	389	1182	1243	1423	2552	16322
% testing positive	59%	58%	54%	65%	41%	50%	55%	56%	49%	55%

Reason for the large number of cases in 2024

The reason for the large number of cases this year, compared with previous years, is because many children entered 2024 without prior exposure to rubella, or without being vaccinated against rubella. Three factors have led to the large number of children entering 2024 without rubella immunity – as follows:

1. Immunity to rubella infection or rubella vaccination is lifelong. If children are not vaccinated against rubella, and never come into contact with rubella virus through natural infection, children will remain susceptible to rubella.

2. Vaccination against rubella has not been part of our routine EPI programme prior to 2024. The Department of Health is presently rolling out the combined measles-rubella-containing vaccine (MRCV), which will be administered to 6 and 12 months old children as soon as each province exhausts their stock of measles-containing vaccine (MCV)
3. The non-pharmaceutical interventions that were applied during the SARS-CoV-2 pandemic interrupted transmission of rubella, and for the period 2020-2022 there were almost no rubella cases identified from the NDoH/NICD fever-rash surveillance (Figure 1, Table 1).

The above three facts mean that children who were born in the last 3-5 years and children between the age of 5-14 years who have not been infected before 2020 during seasonal rubella have had very little natural exposure to wild-type rubella virus, and have not received rubella vaccine. This has created an 'immunity gap' – ie a larger than usual number of children who are susceptible to rubella. The seasonal increase in 2024 has exposed these many susceptible children to rubella infection, and thus, there is a larger number of rubella cases than in prior years.

Clinical implications of the increase in rubella infection

Regarding clinical aspects of rubella infection, in children and adults, rubella is a self-limiting infection that presents with fever and a maculo-papular rash, myalgia, enlarged lymph nodes, headache and conjunctivitis. Occasionally, persons may develop joint pain (arthralgia), low platelets and a mild encephalitis. The complications are usually self-limited. Very rarely, cases of Guillian-Barre syndrome have been reported after rubella. Rubella is of concern because of the risk of rubella infection in women of child-bearing age during the first trimester of pregnancy.

However, rubella infection carries a risk of congenital rubella syndrome. Women who are pregnant in their first trimester and acquire rubella may pass the infection onto their fetus, who may develop congenital rubella syndrome (CRS). In large rubella outbreaks, such as we are experiencing, a risk of CRS exists. However, there are several mitigating factors that will contain the number of cases of CRS, namely;

1. Seroprevalence tests conducted in past years suggests that most women of reproductive age are immune to rubella even through vaccination is not available as part of the EPI programme. Gieles et al¹ demonstrated that amongst pregnant women 18-25 years and older, over 97% were rubella IgG positive.
2. A review of routine NHLS testing data from 2013-2023 demonstrated that amongst 20-24 years olds, the rubella IgG seroprevalence has exceeded 90% in every year (Figure 3).
3. An analysis of positive cases detected in the current year indicates that less than 1% of cases are found in persons 20 years and older (Table 1).

Nonetheless, a risk of CRS exists amongst the small proportion of women who are susceptible to rubella and who develop rubella within the first trimester of pregnancy.

¹ Gieles NC, Mutsaerts EAML, Kwatra G, Bont L, Cutland CL, Jones S, Moultrie A, Madhi SA, Nunes MC. Rubella seroprevalence in pregnant women living with and without HIV in Soweto, South Africa. *Int J Infect Dis.* 2020 Feb;91:255-260.<https://pubmed.ncbi.nlm.nih.gov/31863878>

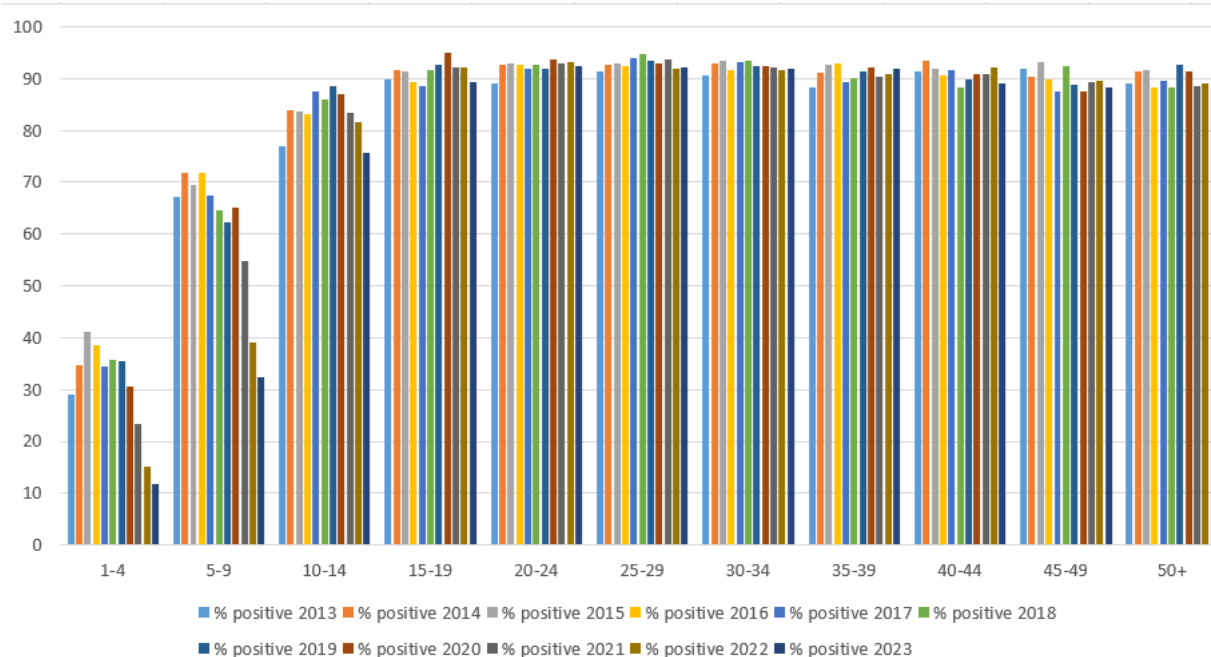


Figure 4. The proportion of cases testing positive by year in each 5-year age category using routine rubella IgG testing data, taken from SDW data from 2013-2023. Rubella testing is conducted at 9 NHLS hospitals and at the NICD. Non-NICD laboratories usually test for rubella as part of ante-natal or gynaecological services, whilst rubella testing at the NICD is done as part of national fever-rash surveillance

Public health response to rubella cases

It is unlikely that a supplementary immunisation activity (SIA) of the combined measles-rubella vaccine will stop or reduce rubella transmission at this stage. The reasons for this include:

- Seasonally and prior to COVID-19, rubella outbreaks start are usually over by November each year (Figure 3). It is likely that the rubella outbreak will be over by the end of the year, if historical disease patterns continue.
- It will take at least 4-6 weeks to organise a national SIA, and there may be delays if the vaccine provider has limited vaccine stock. If a national MR SIA is required for the under 15 year age group, around 18 million vaccine doses will be required; if only the under 5 year age group is targeted, around 5,5 million vaccine doses will be required.
- It is 4 weeks until schools close for the year end holiday. After schools close, it is extremely difficult to obtain high vaccination coverage rates.
- Vaccination is contraindicated amongst woman in their first trimester of pregnancy. Whilst school-age children are not likely to be pregnant, there is a likelihood that some female scholars may be pregnant and are not likely to be aware of their pregnancy. Thus, vaccination carries some obligation to inform and test school-age females of reproductive age for pregnancy.

Public health response to rubella in schools or crèches

Schools and crèches should remain open if there is a rubella outbreak, as school closure will not stop transmission of the rubella virus. This is because rubella has a long incubation period (14-21

days), the virus is excreted for several days before symptoms become apparent, and many cases are so mild that persons are not aware that they are ill.

In the case of an outbreak at a school, by the time the laboratory diagnosis has been confirmed, the virus has already spread to many if not most susceptible persons. School closure will therefore not stop the cycle of transmission.

Persons with rubella should be advised to stay at home if they are highly symptomatic. Infectiousness diminishes markedly within a few days after the appearance of the rash.

Rubella diagnostic testing during the increase in rubella cases

The NICD is inundated with specimens for rubella testing, and there is a backlog of testing because of delays in procuring test kits. The current turnaround time for measles-rubella testing is in excess of 4-7 weeks. Whilst the NICD is attending to the backlog, clinicians should consider carefully if it is clinically helpful to submit specimens for rubella testing.

Rubella serology and PCR testing should be conducted in the following circumstances

- When a pregnant woman in her first trimester of pregnancy is exposed to a case of rubella.
- When a test is required to rule out a diagnosis of rubella in a patient who is severely ill and is admitted to hospital.
- When a neonate is suspected of having congenital rubella syndrome.

In the above cases, the specimen should be marked 'Priority sample, URGENT testing required', and an email should be sent to Busisiwe Masengemi BusisiweM@nicd.ac.za (NICD receiving office), Jayendrie Thaver jayendriet@nicd.ac.za and Lillian Makhathini LillianM@nicd.ac.za (both from CVI laboratory) requesting urgent testing.

In every other context and particularly in schools, creches and day-care centres where a person presents with fever-rash, only the first few cases should have a specimen submitted to the NICD for fever-rash surveillance testing. However, all cases of fever-rash should be notified as suspected rubella.

Managing pregnant women who are exposed to cases of rubella infection

The NDoH may consider issuing provincial health departments with the following advice regarding management of rubella in pregnancy:

- All women should ideally know their rubella sero-status prior to conception. If a woman is susceptible to rubella (IgG negative), she is vulnerable to rubella infection and should ask for a rubella vaccine prior to conception.
- If a woman is already pregnant, and is susceptible to rubella, she should not be vaccinated as the vaccine is contraindicated in pregnancy.
- A woman who is pregnant and is susceptible to rubella, she should attempt to avoid exposure to known rubella and/or fever rash cases.
- If a woman discovers that she is pregnant after being exposed to cases of suspected rubella (ie a case of fever-rash, but no laboratory diagnosis) or to a laboratory-confirmed

rubella case, she should inform her obstetric care practitioners as soon as possible. She should visit her ante-natal clinic or private care provider as soon as possible and not wait until her scheduled visit.

- The antenatal clinic should take blood and a throat swab for rubella testing, and submit it to the NICD. The specimen should be marked 'Priority sample, URGENT testing required', and an email should be sent to the named individuals above.
- If the rubella result is IgM positive, or PCR positive, the woman should be referred for fetal ultrasound to an obstetric specialist unit where an assessment of fetal health may be conducted.

Diagnosis and reporting of congenital rubella syndrome (CRS)

Clinicians should be on alert for neonates born with CRS. The case definition for CRS is as follows:

- An infant in whom a qualified physician detects 1) at least two complications listed in A below or one complication in A and one in B and who has a positive blood test for rubella specific IgM and/or a positive PCR test from any clinical specimen.
- Category A conditions: cataract(s), congenital glaucoma, pigmentary retinopathy, congenital heart disease, loss of hearing.
- Category B conditions: purpura, splenomegaly, microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease, jaundice that begins within 24 hours after birth.

Clinicians who suspect congenital rubella infection may submit blood and nasopharyngeal swabs to the NICD for testing. The specimen should be marked 'Priority sample, URGENT testing required', and an email should be sent to the named individuals above. All cases of CRS should be notified to the NICD using the NMC notification forms found at <https://www.nicd.ac.za/nmc-overview/overview/>.