

Measles

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Measles is a well-known childhood disease that is preventable through vaccination of children at 9 and 18 months of age. The first signs and symptoms are flu-like, soon followed by a fever and characteristic rash. Measles is a highly contagious disease that remains responsible for high numbers of deaths among children in spite of an effective vaccine. Treatment of the disease includes isolation, protection from sharp light, symptomatic support and close observation for possible complications. Measles is a notifiable disease and must be reported to the National Institute for Communicable Diseases (NICD).

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Introduction

Measles is an ancient but still modern disease. Regardless of the availability of a safe and cost-effective vaccine, measles remains responsible for more than 140 000 measles deaths globally, of which at least one-third were in Africa.¹ These deaths occur mostly in children under the age of five.² In South Africa, according to the National Institute for Communicable Diseases (NICD), the majority of these occur in children younger than one year.³ As recently as June 2022, the NICD in South Africa issued a measles alert after four laboratory-confirmed measles cases were reported in May 2022 in Gauteng.⁴

Incidence of measles

Yousif et al., in their six-year review of the incidence of measles in South Africa between 2015–2020, highlighted that the most affected age group was 0–4-year-olds.⁵ Of the confirmed cases, only 26% were vaccinated, 3% were too young to receive vaccines, 5% were not vaccinated, and 65% had vaccinated status unknown. Measles vaccine effectiveness among 1–4-year-olds was 80%. In 2012, the World Health Organization (WHO) aimed to eliminate measles in five of the six world regions by 2020. Using the standard case definition, South Africa achieved the measles elimination target of less than one case per one million nationally between 2015 and 2020, except for 2017 and 2019, when incidence rates exceeded one per million nationally. In 2017, a small outbreak with 186 infected persons was detected in Western Cape, Gauteng, and KZN provinces; and in 2019, a cluster of measles infection was detected in four siblings in Cape Town after travelling to Georgia.^{6,7}

The need for continued vigilance

Before the 1960s and the measles vaccine, measles was a leading cause of morbidity and mortality, resulting in more than two million deaths annually.^{8,9} Outbreaks of measles still occur and remain a leading cause of death among children under five, especially in countries or areas where vaccination coverage is low.^{10,11} All those not previously infected or vaccinated are susceptible to contracting measles. Vaccine-induced immunity wanes over time, so adults who were vaccinated as children may also become susceptible. The immunity acquired after infection lasts for life.³

Measles: the disease

The most important reason for continued vigilance on measles infection is that it is a highly contagious and serious airborne disease. It easily spreads from person to person through inhalation of airborne micro-droplet respiratory secretions from the nose or throat of an infected person; through direct contact with large-droplet respiratory secretions from the nose or throat of an infected person; or less frequently by indirect contact with articles freshly soiled by nose or throat secretions of an infected person.³

Causative agent

The cause of measles is the rubeola virus, a member of the *Morbillivirus* genus, *Paramyxoviridae* family,¹¹ found in an infected person's nose and throat. It spreads when the infected person coughs or sneezes and even through breathing.

Incubation and infectivity

The incubation period is 10–14 days on average (up to 18 days) before symptoms appear. People are contagious from one day before the onset of prodromal (early) symptoms, which is about 4 days before the rash appears, until 4 days after the rash disappears.³

Signs and symptoms

The first symptoms are flu-like symptoms with a fever of up to 40 °C, coryza or runny nose, cough and conjunctivitis (also referred to as the three Cs). Koplik's spots (small red spots with blue-white centres) can appear inside the mouth, especially in children, followed by a classic rash 3–5 days later. The rash starts as maculopapular (small solid elevation of the

skin without pus), erythematous (red) rash from the forehead and behind the ears, down the neck and torso to the arms, legs and feet. The fever and rash disappear after a few days.¹² Other symptoms and signs include body and muscle aches, swelling of lymph nodes in the neck, irritability, lethargy and swelling of the eyelids.

Treatment of measles

As a virus causes it, treatment is symptomatic and supportive, especially for the control of fever, as long as no complications arise. Other supporting interventions include good nutrition, adequate fluid intake, and avoiding sharp light. The WHO advises that vitamin A be administered in areas with known deficiencies or high mortality due to measles.²

 health Department: Health REPUBLIC OF SOUTH AFRICA		
Expanded Programme on Immunisation – EPI (SA) Revised Childhood Immunisation Schedule from April 2009		
Age of Child	Vaccines needed	How and where is it given?
 At Birth	BCG Bacilles Calmette Guérin	 Right arm
	OPV (0) Oral Polio Vaccine	 Drops by mouth
 6 Weeks	OPV (1) Oral Polio Vaccine	 Drops by mouth
	RV (1) Rotavirus Vaccine	 Liquid by mouth
	DTaP-IPV//Hib (1) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Haemophilus influenzae type b Combined	 Intramuscular / Left thigh
	Hep B (1) Hepatitis B Vaccine	 Intramuscular / Right thigh
	PCV7 (1) Pneumococcal Conjugated Vaccine	 Intramuscular / Right thigh
 10 Weeks	DTaP-IPV//Hib (2) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Haemophilus influenzae type b Combined	 Intramuscular / Left thigh
	Hep B (2) Hepatitis B Vaccine	 Intramuscular / Right thigh
 14 Weeks	RV (2) Rotavirus Vaccine*	 Liquid by mouth
	DTaP-IPV//Hib (3) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Haemophilus influenzae type b Combined	 Intramuscular / Left thigh
	Hep B (3) Hepatitis B Vaccine	 Intramuscular / Right thigh
	PCV7 (2) Pneumococcal Conjugated Vaccine	 Intramuscular / Right thigh
 9 Months	Measles Vaccine (1)	 Intramuscular / Left thigh
	PCV7 (3) Pneumococcal Conjugated Vaccine	 Intramuscular / Right thigh
 18 Months	DTaP-IPV//Hib (4) Diphtheria, Tetanus, acellular Pertussis, Inactivated Polio Vaccine and Haemophilus influenzae type b Combined	 Intramuscular / Left arm
	Measles Vaccine (2)	 Intramuscular / Right arm
	6 Years (Both boys and girls)	 Intramuscular / Left arm
 12 Years (Both boys and girls)	Td Vaccine Tetanus and reduced strength of diphtheria Vaccine	 Intramuscular / Left arm
	Td Vaccine Tetanus and reduced strength of diphtheria Vaccine	 Intramuscular / Left arm
 * Rotavirus Vaccine should NOT be administered after 24 weeks.		
 sanofi pasteur The vaccines division of sanofi-aventis Group		

Figure 1: Expanded programme on immunisation – EPI (SA)

Complications

This is the most concerning part of contracting measles and the need for continued vigilance. Complications range from diarrhoea, ear infections, pneumonia, encephalitis, corneal ulceration, and death. For pregnant women, foetal abnormalities, miscarriage, and premature labour are potential complications. Any concerning observations by carers require them to immediately source medical assistance for evaluation and management of the condition.

Prevention

The spread of measles relies on various causes, including increased travelling and pockets of low vaccination and immunity. Measles can be prevented by vaccinating children as recommended by the vaccination schedule of the Department of Health (Figure 1). The measles vaccination is administered in two doses, one at 9 months and the second at 18 months.

Individuals with suspected measles should be isolated and consult their clinic or GP. If unvaccinated, administering the measles vaccine can help prevent infection if administered within 3 days of exposure to the virus. Immunoglobulin is administered to some high-risk individuals after exposure to measles. If there is a suspected outbreak in childcare centres or pre-primary schools, the schools should be closed, and a screening done by the relevant authorities.

Notifiable disease

It is important to note that measles is a notifiable disease in terms of the National Health Act, 2003, and there are regulations setting out the management of this process.¹³ All cases should be reported on the specified forms available on the NICD website (<https://www.nicd.ac.za/diseases-a-z-index/measles/>). There also is a hotline that can be called (NMC HOTLINE: 072 621 3805) for guidance and assistance in this regard. Reporting will require a blood sample and throat swab for laboratory confirmation of the disease.

The family or other carer must contact a health care professional or get assistance from the hotline when a case of measles is suspected.

Conclusion

Staying safe is in our own hands as members of the community. Vaccinate, isolate when necessary, and report – this is what made South Africa achieve the WHO measles elimination target. Let's work together to keep this preventable disease at bay.

References

1. WHO. Joint News Release: More than 140,000 die from measles as cases surge worldwide [Internet]. 2019. Available from: <https://www.who.int/news/item/05-12-2019-more-than-140-000-die-from-measles-as-cases-surge-worldwide>. Accessed 5 Aug 2022.
2. WHO. Measles, fact sheet [Internet]. 2019. Available from: <https://www.who.int/news-room/fact-sheets/detail/measles>. Accessed 5 Aug 2022.
3. NICD Centre for Vaccines and Immunology. 2022. Measles: Prevention of secondary cases. Available from: https://www.nicd.ac.za/wp-content/uploads/2022/06/Prevention-of-measles-in-exposed-persons_20220606.pdf. Accessed 5 Aug 2022.
4. NICD. 2022. Measles Alert. 6 June 2022. Available from: https://www.nicd.ac.za/wp-content/uploads/2022/06/Prevention-of-measles-in-exposed-persons_20220606.pdf. Accessed 5 Aug 2022.
5. Yousif M, Hong H, Malfield S, et al. Measles incidence in South Africa: a six-year review, 2015–2020. medRxiv. 2022. <https://doi.org/10.1101/2022.02.03.22270382>.
6. Hong H, Makhathini L, Mashele M, et al. Annual measles and rubella surveillance review, South Africa, 2017. Natl Inst Commun Dis Public Heal Surveill Bull. 2017;16(2):64-77.
7. Hong H, Makhathini L, Mashele M, et al. Annual measles, rubella and congenital rubella surveillance review, South Africa, 2019. 2020;18(1):3-20. Available from: <https://www.nicd.ac.za/wp-content/uploads/2020/06/ANNUAL-MEASLES-RUBELLA-AND-CONGENITAL-RUBELLA-SURVEILLANCE-REVIEW-SOUTH-AFRICA-2019.pdf>. Accessed 7 Aug 2022.
8. Moss WJ. Measles. Lancet. 2017;390(10111):2490-502. [https://doi.org/10.1016/s0140-6736\(17\)31463-0](https://doi.org/10.1016/s0140-6736(17)31463-0).
9. WHO. Measles and Rubella Global Strategic Plan 2012–2020 Midterm Review [Internet]. 2015. Available from: https://www.who.int/immunization/sage/meetings/2016/october/1_MTR_Report_Final_Color_Sept_20_v2.pdf. Accessed 7 Aug 2022.
10. WHO. Measles, fact sheet [Internet]. 2019. Available from: <https://www.who.int/news-room/fact-sheets/detail/measles>. Accessed 7 Aug 2022.
11. Rima BK, Duprex WP. Morbilliviruses and human disease. J Pathol. 2006;208(2):199-214. <https://doi.org/10.1002/path.1873>.
12. Nemours KidsHealth. Measles. Available from: <https://kidshealth.org/en/parents/measles.html>. Accessed 7 Aug 2022.
13. Department of Health. R1434: National Health Act, 2003 Regulations relating to the surveillance and the control of notifiable medication conditions. Government Printer: Pretoria; 2017. Available from: https://www.gov.za/sites/default/files/gcis_document/201712/41330gon1434.pdf. Accessed 7 Aug 2022.