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Measles containing vaccines indicator

Burden & epidemiology

Number of new cases per year (last 3-5 years)

In 2024 and 2025, 476 412 and 411 913 measles cases were reported to WHO, respectively. However, modelled estimates suggested a far higher number with approximately 11 million cases estimated to occur in 2024 worldwide. This highlights substantial under-reporting due to limited surveillance sensitivity.[1, 2]

In 2025, 27 840 cases of rubella were reported globally to WHO.[3] Congenital rubella syndrome (CRS) is of public health importance due to its teratogenic effects on the fetus during pregnancy, with 746 cases reported to WHO in 2025.[4, 5] However, modelling estimates suggest approximately 100 000 infants are born with CRS globally each year. The true burden of CRS is likely substantially underestimated because of absent or limited surveillance and case detection.[6]

In 2025, 234 954 cases of mumps were reported to WHO.[7] It is endemic globally and cases occur pre- and post-vaccine introduction. Mumps is not a notifiable disease; therefore, data are limited and most estimates are generated from high-income countries (HICs) with longstanding vaccination programmes.[8]

Please consult the relevant position papers for epidemiological burden information on varicella.

Proportion of the population affected by the disease or infected with the antigen

In 2024, measles cases increased by 86% in the WHO Eastern Mediterranean Region (EMR), 47% in the European Region (EUR), and 42% in South-East Asian Region (SEAR) compared with 2019. Notably, the African Region (AFR) experienced a 40% decline in cases and 50% decline in deaths over this period, partly due to increasing immunization coverage.[9]

The age distribution of cases of measles varies depending on the birth rate as well as population immunity, which consequently depends on the vaccination coverage in each age strata.[1]

Like measles, the age distribution of cases of rubella also depends on birth rate and population immunity, which is influenced by the year of vaccine introduction, age range for the pre-introduction catch-up campaign and coverage. Rubella primarily affects children and young adults, with around 50% of infections being asymptomatic.[10] Susceptible women of childbearing age remain of highest concern due to a 90% chance of CRS in the fetus if it occurs during the first trimester of pregnancy.[11]

The highest incidence of mumps occurs in children 5–9 years of age in unvaccinated populations, however in vaccinated populations with sub-optimal vaccine coverage, the burden shifts to older age groups.[8] Complications are more frequent with increasing age and include orchitis (inflammation of the testicles) [12% to 66% of cases]), aseptic meningitis (1% to 10%) and deafness (4%).[12]

Please consult the relevant position papers for more detailed epidemiological burden information on varicella.

Serogroup or serotype distribution (for serogroup- or serotype-specific vaccines)

Measles vaccines target all genotypes, although the dominant wild-type measles genotypes B3 and D8 account for the great majority of contemporary transmission.[13]

Rubella vaccines target all genotypes.[11]

Mumps virus is considered serologically monotypic, although 12 wild-type genotypes have been characterized in circulation.[8]

Please consult the relevant position papers for epidemiological burden information on varicella.

Number of deaths from the disease per year

In 2024, there were an estimated 95,000 measles deaths globally, mostly among unvaccinated or under vaccinated children under the age of five years.[14]

Rubella rarely causes death in uncomplicated cases but during pregnancy may cause miscarriage, fetal death, or stillbirth.[15] There are no reliable estimates of the annual number of deaths specifically caused by rubella.[16]

Mumps rarely causes death in uncomplicated cases but can lead to encephalitis, which accounts for most fatal cases. Encephalitis is estimated to occur in about 1 in 1000 cases.[8]

Please consult the relevant position papers for epidemiological burden information on varicella.

Case Fatality ratio (number of deaths / number of new cases, in %)

The Case-Fatality Ratio (CFR) for measles varies widely, depending on age, nutritional status and access to optimal medical care.[13] It is generally estimated at 0.1–5% but may reach 10–30% during outbreaks among particularly vulnerable populations.[17]

There are no reliable estimates of the CFR for uncomplicated rubella as it rarely causes death.[15]

There are no reliable estimates of the CFR for uncomplicated mumps as it rarely causes death.[18]

Please consult the relevant position papers for more detailed epidemiological burden information on varicella.

Outbreak, epidemic or pandemic risk

Measles is an outbreak-prone disease. In 2024, annual data reported through the Joint Reporting Form (JRF) showed that 59 countries in all WHO regions except the Region of the Americas (AMR)

experienced large or disruptive measles outbreaks. The 58 outbreaks recorded in 2023 were significantly more than the 21 and 37 outbreaks recorded in 2021 and 2022, respectively.[14]

Outbreaks of rubella continue to occur in areas and populations with low vaccine coverage or immunity gaps. CRS rates are highest in low-income countries (LICs) in WHO AFR and SEAR.[3]

Mumps is highly contagious and endemic worldwide with outbreaks occurring approximately every five years in unvaccinated and under-vaccinated populations.[19] Recent outbreaks amongst young adults (in post-secondary education and military barracks) have suggested that immunity to mumps may wane over time.[19, 20]

Please consult the relevant position papers for epidemiological burden information on varicella.

Contribution of the vaccine to achievement of the national, regional or global disease goals

WHO aims to achieve and sustain measles elimination through the Measles and rubella strategic framework: 2021-2030. This requires achieving and maintaining ≥95% population immunity through two doses of measles-containing vaccine, closing immunity gaps, maintaining high-quality surveillance, and rapidly detecting and responding to outbreaks.[21]

Modelled estimates indicated approximately 11 million measles cases in 2024, which is a 71% reduction from 38 million cases in 2000 but an 8% increase over 2019 pre-pandemic levels (10.2 million cases). This rebound was driven by increased numbers in the WHO Eastern Mediterranean Region (EMR= (+86%), European Region (EUR) (+47%) and SEAR (+42%) while decreases have been observed in other regions since 2019, particularly in AFR (-40%).[22]

The estimated number of deaths from measles decreased from 777 000 in 2000 to 107 000 in 2019 and 95 000 in 2024, representing an overall 88% decrease between 2000 and 2024 and an 11% decrease since 2019.[22]

Along with measles, WHO aims to achieve regional rubella elimination, including prevention of CRS. The goal is to maintain high population immunity through vaccination, sensitive surveillance, and outbreak detection and response.[21] The number of reported rubella cases globally has declined by 66%, from 94 277 in 2012 to 31 593 in 2024, with widespread vaccination introduction. Modelled estimates suggest that CRS cases declined by approximately

70% during the same period.[23]

In September 2024, SAGE recommended lifting the previous requirement that countries achieve >=80% measles-containing-vaccine coverage before introducing rubella-containing vaccines. Countries that have not introduced rubella-containing vaccines should consider doing so using established measles platforms, accompanied by strategies to attain and sustain high coverage.[24] Suboptimal post-introduction coverage may result in shifting the burden to older age groups increasing the risk for rubella infection among nonimmune women of childbearing age.[25]

Currently, there is no established WHO global or regional mumps elimination or eradication target, however, there is recommendation that countries should have a well-established, effective childhood vaccination programme.[8, 26] The number of reported mumps cases globally has declined by approximately 57% from 544 093 in 2000 to 234 954 in 2025, with widespread use and uptake of the vaccine.[24] The incidence of mumps in the United States dropped by 99% between 1967 and 1993 after the mumps vaccine was introduced.[27, 28]

Please consult the relevant position papers for epidemiological burden information on varicella.

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