

# Measles, Mumps, Rubella

## Traveler Summary

### Key Points

- Measles, mumps, and rubella—contagious viral infections that occur worldwide—are acquired through inhalation of infected respiratory droplets or contact with infected saliva or contaminated surfaces.
- Risk for measles, mumps, and rubella is high for unvaccinated or inadequately vaccinated travelers, especially in countries with low vaccination rates.
- Symptoms of measles include cough, eye irritation, runny nose, spreading red rash, and white lesions in the mouth. Symptoms of mumps include swelling of salivary glands on both sides of the face, fever, headache, weakness and fatigue, muscle aches, and loss of appetite. Symptoms of rubella include rash, generalized swollen glands, eye irritation, joint pain, and fever.
- Consequences of measles include severe pneumonia and brain inflammation, leading to death. Mumps acquired after puberty can cause painful swelling of the testicles. Rubella acquired during pregnancy can affect the eyes, heart, ears, and nervous system of the developing fetus and cause severe birth defects.
- Prevention includes observing good respiratory hygiene (cough and sneeze etiquette) and hand hygiene (frequent, thorough handwashing).
- All persons 12 months and older, born in 1957 or later, without evidence of immunity or of 2 countable doses of live vaccine at any time during their lives should complete a lifetime total of 2 doses of measles, mumps, rubella (MMR) vaccine (spaced by at least 28 days). For travel or outbreak situations, infants aged 6-11 months should receive 1 dose of MMR vaccine (noncountable), followed by routine vaccination with MMR (2 additional age-appropriate doses).
- Vaccine side effects are most commonly injection-site reactions, fever, and rash.
- Duration of vaccine protection following a complete series is lifelong; no booster is routinely recommended.

### Introduction

Measles (rubeola; red measles), mumps, and rubella (German measles) are contagious viral infections occurring worldwide and are spread from person to person through inhalation of or contact with infected respiratory droplets. These infections can have severe complications, and risk is greatest for unvaccinated travelers, especially for those exposed in countries with low vaccination rates.

### Risk Areas

A surge of measles last spread across Europe (both Western and Eastern) in 2018. Vaccination coverage has declined since 2019 because of the COVID-19 pandemic and large outbreaks were reported in Africa, the Eastern Mediterranean Region, South America, and Southeast Asia in 2020.

In the US, more than 25% of all reported cases since 2000 (when measles was declared eliminated in the US) have been internationally imported, mainly in unvaccinated foreign visitors and US residents (62% of cases) with a history of travel to the Western Pacific Region and Europe. In some years, most recently 2019, the imported cases led to large chains of transmission in communities throughout the US.

Mumps occurs worldwide and remains a common disease in many parts of the world. Large outbreaks continue to occur in North America and New Zealand, even among fully vaccinated persons (especially college students).

Rubella occurs worldwide; however, the Americas have eliminated indigenous rubella. Major outbreaks regularly occur in Japan. In the US, rubella virus transmission in the local population has been eliminated, but imported cases occur.

### Transmission

Measles, mumps, and rubella viruses are mainly transmitted person to person through inhalation of infected respiratory droplets or contact with infected saliva or contaminated surfaces.

### Risk Factors

Risk is increased for unvaccinated or inadequately vaccinated travelers, especially those going to countries with low vaccination rates.

## Symptoms

Symptoms of measles most commonly appear about 7 to 21 days following exposure and include high fever, cough, eye irritation, runny nose, a red rash starting at the head and spreading downward and outward to the trunk and limbs over 3 to 4 days, and white lesions in the mouth, which appear 1 to 2 days prior to the rash.

Symptoms of mumps develop about 12 to 25 days following exposure and include swelling of salivary glands on both sides of the face that may be preceded by several days of low-grade fever, headache, weakness and fatigue, muscle aches, and loss of appetite. Painful swelling of the testicles, nausea, vomiting, and fever commonly occur with mumps acquired after puberty. Mumps infection can be very severe if contracted in adulthood.

Symptoms of rubella most commonly appear 12 to 23 days following exposure and include a rash, generalized swollen glands, eye irritation, joint pain, and slight fever.

## Consequences of Infection

Measles can result in severe pneumonia, diarrhea, and brain inflammation, leading to death. Mumps can result in inflammation of the pancreas, brain, and spinal cord; male infertility; and transient or permanent hearing loss. Rubella acquired during pregnancy and transmitted to the developing fetus (congenital rubella syndrome) is associated with severe complications involving the eyes, heart, ears, nervous system, and blood, as well as growth disturbances.

## Need for Medical Assistance

Persons who have been exposed to or develop symptoms of measles, mumps, or rubella should seek medical attention for evaluation of the need for postexposure prevention or treatment. MMR vaccine or immune globulin given for measles postexposure prevention (depending on the person's age and the time since exposure) may reduce the duration and severity of illness.

## Prevention

### Nonvaccine

Observe good respiratory hygiene (cough and sneeze etiquette) and hand hygiene (frequent, thorough handwashing).

Immune globulin, a human blood-derived product that can be used for all ages, is given as temporary protection if MMR vaccine cannot be used.

### Vaccine

Vaccination is the best available tool for preventing measles, mumps, and rubella. MMR vaccine (live) is given routinely as a childhood vaccination and is also given to individuals born in 1957 or later (1970 or later in Canada and the UK; 1966 or later in Australia), without evidence of immunity (e.g., laboratory evidence of immunity or laboratory confirmation of disease), or of 2 countable doses of live vaccine at any time during their lives.

For travel, vaccination with MMR vaccine is recommended for all nonimmune travelers aged 6 months and older regardless of their destination.

Duration of protection for measles and rubella is more than 20 years with 2 doses of MMR vaccine, whereas protection against mumps gradually declines.

A vaccine against measles, mumps, rubella, and varicella (MMRV) is also available for use in children aged 12 months through 12 years.

### Side Effects

The most common side effects following MMR vaccination include injection-site reactions (burning or stinging) or fever in up to 15% of vaccinees, and a generalized or measles-like rash in up to 2% of vaccinees. An increased risk of seizures (due to fever) exists about 8 to 14 days after vaccination but the seizures are not associated with long-term adverse consequences.

Rarely, local reactions (pain, swelling, tenderness), muscle pain, sore throat, swollen lymph nodes, tiredness, fainting, or irritability may occur.

Persons with underlying medical conditions or who have concerns about the vaccine should speak to their health care provider before vaccine administration.

## Timing

MMR vaccine is given as follows:

- Routine, regardless of travel for children 12 months and older: 2 doses, given at 12-15 months of age and 4-6 years of age.
- If earlier protection is needed for travel:
  - Persons 12 months and older without evidence of immunity or of 2 countable doses of live vaccine at any time during their lives: 1 dose or 2 doses given at least 28 days apart prior to travel to complete a lifetime total of 2 doses.
  - Children 6-11 months of age: 1 dose prior to travel regardless of destination country or in outbreak situations. This dose is noncountable and the child will still need to receive 2 doses at the recommended ages (at least 28 days apart).
- Two lifetime doses before departure will provide protection for healthy persons. A third dose may be given during specific mumps outbreak situations if necessary.

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