

Measles virus testing—What does each test tell us?

Measles Virus Nucleic Acid Testing (NAT)

WHAT

Testing respiratory swabs and/or urine for nucleic acid from the measles virus.

WHY

Measles nucleic acid testing is the recommended laboratory test for measles diagnosis as it confirms the presence of the virus in a sample.

WHEN

Measles NAT must be requested for a given sample.

Results are reported directly to the ordering provider. Positive samples are also reported to the regional health authority (RHA).

✓ **Diagnostic**

Measles Vaccine Strain NAT

WHAT

Testing respiratory swabs and/or urine for nucleic acid specific to the strain of measles virus contained in the vaccine.

WHY

Nucleic acid testing can distinguish between measles virus acquired through recent vaccination versus wild-type measles infection.

WHEN

Positive measles NAT samples automatically get tested for the vaccine strain to further characterize the virus. Results are reported directly to the ordering provider. Positive samples are also reported to the RHA.

✓ **Virus characterization (wild-type versus vaccine strain)**

Genotyping via Targeted Sequencing

WHAT

Sequencing a region (N-450) of the measles virus from a clinical sample to determine the measles virus genotype.

WHY

Genotypes help further characterize the measles virus and understand global circulation patterns. To enable finer discrimination within a genotype, distinct sequence IDs (DSIDs) were introduced.

WHEN

One sample per measles case automatically gets genotyped via targeted sequencing. Genotypes are periodically reported to RHAs.

✓ **Genotype (e.g. D8)**

✓ **DSId (e.g. 9171)**

✗ **Transmission Dynamics**

Whole Genome Sequencing

WHAT

Sequencing the entire measles virus from a clinical sample.

WHY

Sequencing the entire measles virus provides high-resolution data that allows us to compare samples that have the same genotype and DSId and understand how related they are—at the level of individual mutations. WGS can help us distinguish between new introductions and local transmission events.

WHEN

Upon request, approval required. Reporting and operationalization in development.

✓ **Genotype**

✓ **DSId**

✓ **Transmission Dynamics**

✓ **Genomic epidemiology**