

# Collection and handling of laboratory samples for measles eradication and rubella control

## Blood samples from suspected cases:

- In outbreak situations, blood samples should be taken from the first few suspected measles or rubella cases of the outbreak and from all other cases that do not occur in the same municipality or district. Samples may also be taken from any atypical or unusual cases. Samples are not needed from cases epidemiologically linked to other already confirmed cases.
- When sporadic suspected measles or rubella cases occur (dispersed geographically and/or in time), blood samples should be taken from every case.
- Blood samples from all suspected rubella cases that are IgM negative for rubella should be tested for measles, ideally within 24 hours\* and vice versa.
- Blood samples from at least 10% of the suspected dengue cases with rash that are IgM negative for dengue should be regularly tested for measles\*.

## Samples for viral isolation from suspected measles cases:

- In outbreak situations, urine samples should be taken from the first few cases of the outbreak (5-10 samples). If attempts to isolate virus are unsuccessful, then additional urine samples should be taken from new cases as they occur. Urine samples should also be taken from cases that do not occur in the same municipality or district. They may also be taken from any atypical or unusual cases.
- When sporadic cases occur (dispersed geographically and/or in time), urine samples should be taken from every case at the first opportunity.
- Whenever urine samples cannot be taken (i.e. in some young children), a wipe of the nose and throat with a sterile swab (nasopharyngeal swab) should be taken instead.
- Ideally, samples for virus isolation should be taken within 1-3 days after rash onset, and no more than 5 days after rash onset. However, for sporadic cases, because there may be limited opportunities to take the sample, samples can be taken up to 7 days after rash onset.
- Samples for virus isolation should be shipped to the laboratory indicated in your country as soon as possible.
- The national laboratory responsible for managing measles specimens will test (or forward to a reference laboratory for testing) the specimens of those cases with measles serum IgM positive results.
- Ideally, only half of the sample should be used for viral isolation. The other half should be stored at minus 40- 70 C° as a backup in case of contamination or other technical problems with the sample tested.

## Samples for viral isolation of suspected rubella cases:

- In outbreak situations, nasopharyngeal swabs should be

taken from the first few cases of the outbreak (5-10 samples). If attempts to isolate virus are unsuccessful, then additional samples should be taken from new cases as they occur. Nasopharyngeal swabs should be used to wipe the nose and throat. The virus is extremely cell-associated, so attempt to swab the throat and nasal passages to collect epithelial cells. Place both swabs (from the nose and throat) in a sterile tube containing 0.5-2 ml of viral transport media.

## Storage and transport of samples for viral isolation

- 50-100 ml (1.5-3 ounces) of urine should be taken in a sterile container. If no sterile container is available, a clean container can be boiled and used instead.
- The urine should be kept refrigerated at 4-8 C° until it can be centrifuged.
- Ideally, all urine samples should be cold before centrifugation.
- The urine should be centrifuged, ideally on the same day it was taken, at 1500 RPM (about 500 x g) for 5 minutes. A refrigerated centrifuge is *not* a requirement.
- The pellet should be immediately re-suspended in 0.5-2 ml of viral transport media (VTM)\*\*.
- In the field, centrifuged urine and nasopharyngeal swab specimens can be refrigerated at 4-8 C° for up to five days until they can be stored in a -70 or -40 C° freezer.
- As soon as possible, the sample should be sent to a laboratory equipped with -70 or -40 C° freezers. ***Because of the risk of damaging the viruses, samples should never be kept at -20 C°.***
- When samples are ready to be sent to the national laboratory, they should be shipped in coolers with ice packs.
- In the case of samples that have been frozen at -70 or -40 C°, they must be shipped in dry ice to the national laboratory.
- If for any reason centrifugation is not possible, ***the urine can still be shipped immediately to the national laboratory in coolers with ice packs.*** It might still be viable for virus isolation if it reaches the laboratory within five days from the day it was taken.
- In the case of a nasopharyngeal swab, the swab should not be centrifuged. It should be placed in a sterile tube with 0.5-2 ml of VTM.

## Information regarding the samples

- Information to be sent with the sample should include the following:
  - unique identifier number (MESS number where available)
  - full address and complete phone number to which results should be reported
  - age of patient
  - date of rash onset

- date of collection of sample
  - date of last vaccination with a measles-containing vaccine
  - date of last vaccination with a rubella-containing vaccine
  - if the case is sporadic or part of an outbreak.
- Paper documents should be well protected from the ice in a well-sealed plastic bag or similar.
  - The laboratory that receives the samples should record the condition of the sample upon arrival (did the container leak?, was there an ice pack?, were the contents kept cold in transit from the point of collection?). This

information should be shared with the sender so errors can be corrected in future shipments.

- \* In the case of laboratory–confirmed rubella or dengue outbreaks, the total number of samples that are negative for either rubella or dengue might be overwhelming. In such a case, the surveillance team, in conjunction with the laboratory, should decide which samples to test for measles.
- \*\* VTM should be made available to all health centers by the national laboratory of each country. VTM usually contains sterile phosphate buffered saline (PBS) or suitable isotonic solution such as Hank’s BSS, etc., containing antibiotics (100 units/ml penicillin, or 100 mg/ml streptomycin) and either 2 % fetal bovine serum or 0.5 % gelatin in plastic, screwcap, centrifuge tubes. VTM should be kept either frozen or refrigerated until it is used.

## Update on Global Polio Eradication

The world is about to witness another public health victory with the achievement of the global poliomyelitis eradication. Since the launch of the global polio eradication campaign at the World Health Assembly in 1988, countries have continued to make steady progress towards successfully interrupting the circulation of wild poliovirus. The number of polio cases has decreased from an estimated 350,000 in 1988, to some 5,200 reported cases in 1999. The proportion of the world’s children living in polio-infected areas has dropped from 90% to less than 50 percent. The disease has already been eradicated from Europe, the countries of the Western Pacific, a large portions of the Middle East, Northern and Southern Africa. In 1991, the Americas became the first region in the world to eradicate polio.

At this point, the conclusion of the global eradication initiative depends on the efforts carried out by 30 countries in sub-Saharan Africa and South Asia. Many of these have either been affected by civil conflict or remain reservoirs of poliovirus. India, with 70% of the world’s remaining polio cases holds the key to the success of global eradication. WHO plans to accelerate its eradication and surveillance efforts in the endemic countries. Extra rounds of National Immunization Days (NIDs) in 2000 and 2001 will be conducted in Afghanistan, Angola, Bangladesh, Democratic Republic of the Congo, Ethiopia, India, Nigeria, Pakistan, Somalia and Sudan.

In a recent joint appearance the heads of WHO and UNICEF appealed to the leaders of these 30 countries to provide leadership for additional immunization activities, to allocate sufficient resources to support NIDs and routine immunization, as well as surveillance, to mobilize support from the national to the community level, and to facilitate truces in conflict areas. The longer intense poliovirus transmission continues in sub-Saharan Africa and South Asia, the higher the risk of re-infecting areas that are now free of the disease. Major outbreaks in Angola and Iraq in 1999 demonstrate the fragility of the progress that has been made. Furthermore, a delay in achieving the target on time would increase the total cost of eradication by as much as US\$ 100 million each year. There is also concern of the difficulties of sustaining current levels of funding for more

than 24 to 36 months, especially in polio-free countries that would need to maintain NIDs to protect themselves from importations.

The international community has been responding to the call for additional financial resources to meet the eradication challenge. Efforts are also being made to improve the capacity of the UN system in responding to the demands of an accelerated program, by better planning and by enhanced coordination with vaccine manufacturers and donor governments, to avoid any disruption in scheduled immunization days. Other efforts underway include the assurance of cease fire, or safe working environment in areas of conflict, to gain access to unreached communities. It has been estimated that when all countries are certified as polio free, approximately US\$ 1.5 billion in treatment will be saved per year. The Region of the Americas best way to support the global efforts is by maintaining its surveillance indicators for acute flaccid paralysis and high immunization coverage rates!

Source: World Health Organization

**AFP Surveillance Indicators, 1999\***

Country	80% weekly reporting units	80% of cases investigated within 48 hours	80% of cases with 1 adequate stool sample taken	AFP Rate ≥ 1:100,000 in children < 15 years
Chile				
Colombia				
Honduras				
Mexico				
Nicaragua				
Cuba				
Ecuador				
Argentina				
El Salvador				
Guatemala				
Panama				
Peru				
Venezuela				
Bolivia				
Brazil				
CAREC				
Dominican Republic				
Paraguay				
Uruguay				
Costa Rica				
Haiti				

\* Data as of 4 December 1999  
Source: HVP/PAHO (PESS)