WORLD HEALTH ORGANIZATION

DIVISION OF PACIFIC TECHNICAL SUPPORT



PACIFIC HOSPITAL-BASED ACTIVE SURVEILLANCE SYSTEM (HBAS)

INFORMATION FOLDER

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# HOSPITAL-BASED ACTIVE SURVEILLANCE SYSTEM

A sub-Pacific region-wide Hospital-Based Active Surveillance (HBAS) system was established in 1997 by WHO under the PPHSN framework as part of the Global Polio Eradication Initiative (GPEI). The objectives of the system then were to prove that the Pacific Island Countries (PICs) were free of poliovirus, and to date, it continues to serve as the basis of certification as such; and to monitor the maintenance of polio-free status until reaching the goal of interrupting all remaining wild poliovirus type 1 (WPV1) and circulating vaccine-derived polio virus type 2 (cVDPV2) transmission chains, per the GPEI Polio Eradication Strategy 2022-2026. Also, the acute flaccid paralysis (AFP) surveillance system platform has played an integrated vaccine-preventable disease (VPD) surveillance, and the conditions of “suspected measles” and neonatal tetanus (NT) were included from the start.

The HBAS system has since grown to incorporate more than 80 hospitals in 20 Pacific Island countries and areas and over 300 pediatric clinicians and medical officers. In 2001, surveillance was expanded from “Suspected Measles” to Acute Fever and Rash (AFR) to better identify cases of measles and other diseases like rubella and dengue. The HBAS is one of the surveillance pathways existing in PICS however it has not been fully utilized and monthly reports have not been submitted to the Division of Pacific Technical Support, WHO in Suva since 2014, due to numerous reasons such as no assigned Hospital Coordinator (HC), lack of interest and accountability and inadequate resources.

The backbone of the HBAS system is the Pacific hospital-based Pediatric Clinicians and medical practitioners, who report monthly on a standard surveillance form to their HBAS Hospital Coordinator (HC) as to whether they have seen any cases of AFP, AFR or NT. This information is then forwarded by the Hospital Coordinator to the HBAS National Coordinator (NC), who collates reports from all HBAS reporting sites within the country. National reports are submitted to WHO regularly on a monthly basis.

The HBAS system is considered comprehensive for detecting all AFP cases in the Pacific. However, specialists and hospitals are limited to areas that are densely populated locations where they can be properly resourced and staffed such as Apia, Honiara, and Suva. HBAS is mainly conducted in public hospitals, however, it is also important to include private hospitals in the system, as they may be the first healthcare to see suspected measles cases. Moreover, public hospitals also function primarily as a surveillance site for AFR illnesses, this is because not all AFR cases would be expected to present in a hospital or healthcare setting and as such, community surveillance is also required. However, hospital-based surveillance for AFR has been considered and remains sensitive enough to detect and alert when disease outbreaks occur, and this has been confirmed with the outbreaks of rubella in Tonga (2002), Samoa (2003), Fiji (2011), Solomon (2012) and Measles in Solomon (2014), Vanuatu (2015), Samoa, Tonga, Fiji, and Kiribati (2019).

The quality of Measles and Rubella surveillance declined globally and throughout the region, especially at subnational levels, during the COVID-19 pandemic. On the other hand, the status of measles and rubella verification in the Western Pacific Region as of September 2022, was achieved in 8 countries and areas verified as having eliminated measles while 7 countries and areas as having eliminated rubella. To prevent large-scale outbreaks due to risk of resurgence or increasing imported-related measles outbreaks, it is critical to strengthen surveillance performance coupled with rapidly filling immunity gaps with high-quality immunization response such as SIAs and strengthening immunization services.

The Western Pacific Region (WPR) has been polio-free since 2000, however, the polio risk assessment on PICs including type 2 polio conducted in 2021 was a medium risk. Vanuatu was reported as high risk in the overall polio risk assessment. Fiji and the Solomon Islands are the countries that have been reporting AFP annually. The other 2 countries that have reported AFP during the last 5 years are Tonga and New Caledonia. The lack of awareness and interest in AFP surveillance has been a persistent and critical issue in the PICs.

In 2014, the Regional Committee endorsed the Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific, which specifies MNT elimination as one of the eight regional immunization goals in the Western Pacific. While PICs have eliminated maternal neonatal tetanus, it is imperative to maintain MNT elimination status in every country and area with effective NT surveillance and ensure high vaccination coverage.

Considering the above-mentioned HBAS performance and targeting Measles and Rubella elimination in 2025, sustaining polio eradication and accelerated control of VPDs in the PICs, there is an urgent need to strengthen the existing HBAS, through a more comprehensive including priority VPDs and integrated VPD surveillance system.

One of the strategies under the strategic objective of managing health intelligence on VPD and immunization in WPRO through 2030 is to enhance the strategic use of epidemiologic intelligence through an optimized and integrated VPD surveillance system for immunization and VPD control and elimination. While the HBAS has been focusing primarily on AFP, AFR and NT, the folder pathway will also be covering VPD surveillance as an integral part of a country’s overall surveillance and immunization program strategies to have a more effective and impactful system.

This Information Folder is the second major update of the original AFP/EPI Surveillance Folder since it was developed by WHO in 1997. The first update was made in 2005. Key amendments of 2023 update are:

* An updated narrative HBAS main folder (status on measles elimination and polio risk assessment, review of registers within the hospital facility, included indicators for well-performing surveillance on measles, rubella, and NT, classification of AFP cases, contact tracing, outbreak response immunization, and highlighting special consideration for neonatal tetanus surveillance through audits of neonatal deaths etc.)
* An updated AFP Case Investigation Form with additional details identifying the source of reporting, socio-demographic, and travel history of the case relevant to viral transmission and localization of anatomical weakness
* An updated AFR Case Investigation Form with additional details on recent travel and contact history, sample collection, and final classification
* An updated suspected case definition of NT including any neonate who died of an unknown cause during the first month of life was added as additional criteria
* VPD Surveillance and Priority VPDs e.g., Diphtheria, and Pertussis with the proposed goal of accelerated control and target zero deaths are briefly discussed in the HBAS folder.
* An updated WHO-PPHSN and Laboratory contact details
* Under Retrospective record review protocol, updated total reported AFP cases and indicators from 2013-2022 and International Classification of Diseases (ICD) codes from 9 to 11

# MONTHLY HBAS FORM COMPLETION AND SUBMISSION

## 2.1 Obtaining Information from the Key Clinicians

At the start of every month, the Hospital Coordinators at each HBAS reporting site should check with the “child specialists and medical practitioners” at their site to inquire them whether, in the preceding month, they have seen any:

1. Children under 15 years of age with Acute Flaccid Paralysis (AFP) and or any patient, regardless of age, that the clinician suspects could have polio
2. Any patient regardless of age with Acute Fever and non-vesicular (non-blistering) Rash (AFR) or inpatient that the clinician suspects could have measles infection
3. Any suspected cases of Neonatal Tetanus (NT) and neonatal deaths (ND)
4. Other prioritized VPDs e.g., Diphtheria, Pertussis, etc.

Case classification should be according to the “standard case definitions” as defined later in this manual.

Clinicians should indicate whether they have seen any cases of the above by placing a tick mark (**√**) in the “Yes” or “No” column of the appropriate box on the HBAS Monthly Reporting Form (Annex A), write the date, and sign the form.

If the Hospital Coordinator (HC) is absent a designated substitute should make sure the form is completed promptly. If a listed clinician is absent, the Hospital Coordinator should write in the “signature” space an explanation for the absence (e.g., “transferred” or “on leave” and no consultation activity). However, if a clinician substitute is present to conduct a consultation, he/she is briefed and informed to report any cases mentioned above.

If new “child specialists and or medical practitioners join the hospital staff, the Hospital Coordinator should add their names to the form and have them begin signing the form each month. It will be ideal to update the list of clinicians with their email addresses and cell phone numbers at the hospital consulting patients every 6 months and or at least every year.

## 2.2 Reviewing the Out/In-patient/Emergency Room and Laboratory Registers

After obtaining reports from all the child specialists and medical practitioners, the Hospital Coordinator should review the hospital in-patient and outpatient including ER registers for the preceding month to ensure that any possible cases of AFP, AFR, NT, and other priority VPD diseases e.g., Diphtheria, Pertussis have not been missed.

It is important to check the in-patient registers of all wards (pediatric, neurology, ICU, orthopedic, and rehab), outpatient, and ER consultation rooms where cases that could have been admitted and consulted are reviewed for AFP, AFR, NT, and other priority VPDs. During the review by the Hospital Coordinator and active visit by the national HBAS coordinator or national surveillance officer, it is essential to conduct refresher or informal orientation to ensure the healthcare providers are aware of AFP, AFR, NT, and other priority VPDs case definition and assure they recognize signs and symptoms, knows completing case investigation form and specimen collection procedures. In some countries, the pediatric wards only admit children up to 12 years of age, with children above this age admitted to adult wards, hence the in-patient registers in the adult wards in this example will need to be reviewed for children presenting with AFP and AFR. It is also important to note that the Hospital or National HBAS coordinator and/or Surveillance Officer should also examine the laboratory register, where walk-in patients may have been referred directly for laboratory investigation or workup.

In-patient register reviews should search for children aged less than 15 years that present with acute flaccid paralysis, including Guillain-Barré Syndrome, or with presentations based on signs and symptoms suggestive of AFP such as:

* Acute inability to move a limb.
* Acute onset of limb weakness, or loss of motor strength in any other muscle(s)
* Acute abnormality of gait or inability to walk

And although poliovirus is no longer endemic in the Pacific, it is important that healthcare providers rule out poliovirus infection in cases of acute flaccid paralysis (AFP) that may look like clinically polio, to ensure that any importation of poliovirus is quickly identified and investigated. During the review of patient registers, suggestive AFP cases must be tagged, and the individual record further screened for AFP. However, if an inpatient clinically presents as AFP, case investigation and examination must be immediately conducted by the attending medical officer or pediatrician.

During the initial phase of measles and rubella infection, patients may be recorded in the register only as rash with or without fever. While, the rash has not been categorized as non-vesicular, the suspected case must be tagged and investigated especially if no follow-up consult has taken place.

Neonatal tetanus is defined and its clinical diagnosis. Neonatal tetanus-like illness including neonatal death for unknown reasons within the first month has to be investigated and reported.

Pertussis should be suspected in babies and young children during early symptoms or the catarrhal stage when apnea and cyanosis are observed, and later develop uncontrolled coughing fits.

As the cases of diphtheria are almost negligible in the PICs due to the DPT vaccine, and with limited knowledge of the prevalence of diphtheria in the post-vaccination era, most medical practitioners/pediatricians may misdiagnose the diphtheria cases as streptococcal infections.

## 2.3 Submitting the HBAS Monthly Reporting Form

The Hospital Coordinator should send each month one copy of the completed HBAS Monthly Reporting Form to the National HBAS Coordinator. It is important that the National HBAS Coordinator reviews the number of cases or zero cases reported and provides feedback on the monthly report of the Hospital Coordinator. A copy of the form should also be filed in a HBAS folder at the reporting site. The National HBAS coordinator should maintain a simple table to track the completeness and timeliness of reporting.

The National HBAS Coordinator should send copies of the completed HBAS Monthly Reporting Forms from all reporting sites through their country's WHO Office and cc to the WHO Division of Pacific Technical Support in Suva. If the country doesn’t have a WHO office, should send directly to the WHO Division of Pacific Technical Support in Suva (WHO Office contact details listed in Annex F1).

## 2.4 The HBAS Monthly Reporting Form

A sample HBAS Monthly Reporting Form is provided in Annex A. This form can be used as a template for all reporting sites and used when updating the list of child specialists and medical practitioners. An electronic copy of this form is also provided that comes with this manual or alternatively can be obtained by contacting the WHO Division of Pacific Technical Support in Suva and or through the PPHSN website.

A new set of HBAS Monthly Reporting Forms will need to be produced each year by the Hospital Coordinators at all reporting sites, using this template. The Hospital Coordinator should also review the list of child specialists and medical practitioners at this time, and if any changes are made the National HBAS Coordinator should also be informed.

## 2.5 Indicators used to measure HBAS system reporting performance

* Reporting site HBAS reporting Completeness rate (Target > 90%)

(All designated reporting sites should send reports of AFP/AFR/NT and priority VPDs, even if no case is reported. This is referred to as zero reporting.)

% Completeness of Reporting = # monthly HBAS Report forms received x 100%

# HBAS Report forms expected

* Reporting site HBAS reporting Timeliness rate (Target 90%)

(All designated reporting sites should send reports monthly on or before one week after end of the month.)

% Timeliness of Reporting =# monthly reports received specified deadline x 100%

# HBAs Report forms expected

The indicators used to measure HBAS system reporting performance must be visualized through either a graph or map allowing one to identify and monitor chronic problem-reporting sites

# ACUTE FLACCID PARALYSIS (AFP) CASE INVESTIGATION

## AFP Case Definition

The WHO case definition is “Any case of acute flaccid paralysis in a child aged less than 15 years, presenting with sudden onset of floppy paralysis or muscle weakness due to any cause, or any person of any age with paralytic illness if poliomyelitis is suspected by the clinician.

Guillain-Barré Syndrome is the most common cause of acute flaccid, neuromuscular paralysis, and the main differential diagnosis of poliomyelitis.

## Investigating and reporting an AFP case

**3.2.1 Case Investigation**

If a clinician sees a child who presents with AFP, or a patient of any age whom the clinician suspects could be polio, the clinician should:

1. Notify the Hospital Coordinator or National Coordinator urgently by phone followed by filling in the case notification form. Rapid identification of AFP cases is essential to enable early detection of poliovirus in stool specimens
2. Refer the patient to the hospital for admission and stool specimen collection. If the child is not to be admitted the clinician still must ensure that two stool samples are collected 24-48 hours apart (see 3.3 on procedure for stool sample collection).
3. The clinician should investigate and complete a copy of the Acute Flaccid Paralysis Case Investigation Form (Annex B1), ensuring all information is filled in and if some information does not apply, it should be mentioned in the form and not left blank. Additional clinical information can be noted on the back of the form if additional space is required
4. Send a copy of the completed case investigation form to the Hospital Coordinator
5. Make sure that the “Yes” column in that month’s HBAS Monthly Reporting Form is ticked appropriately, and that relevant identifying details of the case are provided on the reverse side of the form
6. Ideally, all AFP cases should undergo a 60+day follow-up examination. However, for the following categories of AFP cases, 60+day follow-up examination is **a requirement**:

* AFP cases **without stool specimen collection** or for which only **inadequate stool specimens** could be collected
* AFP cases **with isolation of vaccine-type (Sabin-type) poliovirus**
  + 1. **Case Notification and Reporting**

On notification of an AFP case, the Hospital Coordinator should:

1. Contact the National Coordinator to notify case details and arrange for necessary assistance with stool sample shipment and ensure that the correct shipping containers are available. If necessary, the National Coordinator can contact the WHO Country Office and WHO Division of Pacific Technical Support in Suva for assistance with stool shipment and containers
2. Ensure that the two (2) stool samples are taken for the child, at the correct time interval of a minimum 24 hours apart and stored at appropriate temperatures (see 3.3) until the sample is shipped. Liaison between the HC and the ward nurses might be required for stool collection
3. Ensure that the clinician completes the AFP case investigation form promptly; review the information provided and clarify any missing information before sending
4. Send a copy of the Case Investigation form to WHO Country Office and WHO Division of Technical Support in Suva (via the National Coordinator) and file a copy of the form in the reporting sites HBAS folder

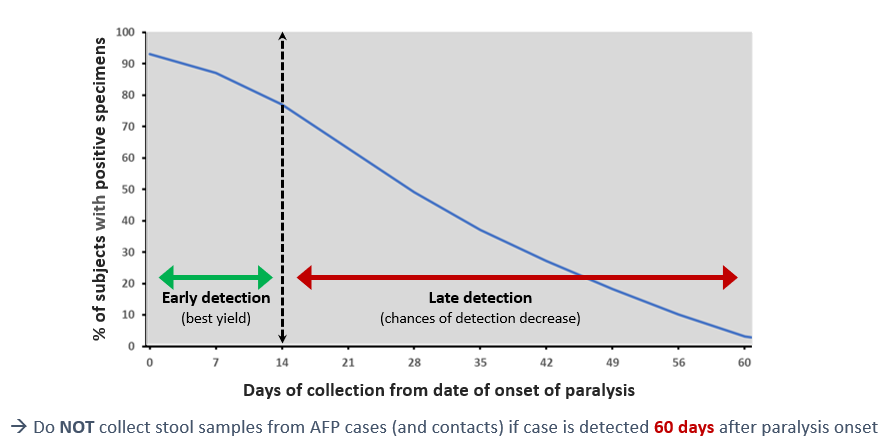
On notification of an AFP case, the National Coordinator should:

1. On receipt of the Case Investigation form, forward this to the WHO Country Office and WHO Division of Pacific Technical Support in Suva
2. Confirm that the appropriate stool collection containers and shipping packages are available for stool collection and shipment
3. Liaise with the country laboratory, WHO Country Office, WHO Division of Pacific Technical Support in Suva, and the Pacific Polio Testing Laboratory at the Victorian Infectious Disease Reference Laboratory (VIDRL) in Melbourne, Australia to ensure that stool sample shipment proceeds smoothly and that required notifications of shipment are received by VIDRL
4. Arrange for the reporting site to be promptly re-supplied with stool sample collection kits and shipment containers. Please liaise with WHO Country Office or WHO Division of Pacific Technical Support in Suva for an additional supply of stool sample collection kits and shipment containers

**Note**: when the child’s 60+day follow-up is due, liaise with the Hospital Coordinator to ensure that this occurs promptly, and the results are forwarded to the WHO Country Office and WHO Division of Pacific Technical Support in Suva

## AFP stool specimen collection

1. Collect TWO (2) stool specimens from the child 24-48 hours apart, and within 14 days of onset of paralysis (or as soon as possible thereafter) but not later than 60+ days after onset of paralysis. An appropriate quantity of stool required for laboratory testing is about the size of an adult thumb. Glycerin suppositories can be used to assist stool collection, but either the 1st third of the stool sample or any stool material that was in direct contact with the suppository should be discarded.

Figure 1. Polio virus detection in stool specimen

1. If the child is not admitted, or admission is delayed, specimens should be collected as an outpatient or at an outlying health facility, and stored appropriately, and forwarded to the hospital in a cold box/cooler (new ice packs should be replaced after 48 hours), ideally at the same time as the patient.
2. If specimens cannot be collected at a health facility and must be collected at the home of the case, leave a sample collection and transport kit with frozen ice packs with the caregivers so that they can collect from the case later. Ensure the instructions to collect are clearly understood (use simple language if needed); leave your telephone number in case of questions or problems and make an appointment to return to change the ice packs and to collect both specimens.
3. Seal the container with tape, wrap it with absorbent material such as cotton wool, and seal in a plastic bag. Keep stool specimens always refrigerated at +4 0C to +8 °C after collection and during shipment (transport using a reverse cold chain).
4. Make sure the statement KEEP ALWAYS REFRIGERATED AT +4 0C to +8 °C. DO NOT FREEZE is included as instructions in the airway bill, and on the outside of the shipping container.
5. If shipment is delayed more than 72 hours after collection the specimen should be frozen (-200C). If a frozen specimen should thaw, DO NOT RE-FREEZE, but keep refrigerated at +4 0C to +8 0C.
6. Store stool specimens apart from vaccines. If this is not possible, enclose the specimens in 3 or 4 plastic bags to avoid cross-contamination.

## 3.4 AFP stool specimen shipment

1. The National/Hospital Coordinator should work with the hospital's laboratory department to ensure that the AFP stool specimens are shipped to the Pacific Polio Reference Laboratory at VIDRL without delay. Stool samples should be sent in special shipping containers that have been provided by WHO. Packaging and labeling instructions are provided in Annex D.
2. Stool specimen must be accompanied by an AFP Laboratory Request Form (Annex C1), and labeled with:
   1. Patient’s name and Hospital Number
   2. Date of birth
   3. Date of onset of paralysis
   4. Date of specimen collection
   5. Name of the hospital where it was collected
   6. Date of last OPV/IPV (where applicable)
3. Stool specimens shipped to VIDRL must be accompanied with 1) a Customs declaration letter and customs invoice with a copy of the airwaybill and case investigation form(s) of cases/patient(s), (templates for the customs declaration and customs invoices are provided in Annex E1 or can be obtained from Division of Pacific Technical Support: WHO Office in Suva. The airwaybill number should be noted on the letter of declaration and invoice, which needs to be filled out by the sending hospital laboratory
4. Before shipping specimens to the VIDRL, send a pre-alert message to the Polio Laboratory at [polio@mh.org](mailto:polio@mh.org) and follow up with a telephone call laboratory if possible (+ 61 3 9342 2607) and provide details of the Airway Bill Number, Flight Number, and estimated arrival time. Full contact details for the Polio Laboratory at VIDRL are provided in Annex F2
5. In addition, please ensure that copies of the case investigation form, lab request form and shipment details are provided by email a copy to the WHO Country Office and WHO Division of Pacific Technical Support in Suva

**Note**: **Adequate stool: Two specimens collected within 14 days of paralysis onset and**

**at least 24 hours apart; each specimen must be of adequate volume (8-10 grams)**

**and arrive at a WHO-accredited laboratory in good condition (i.e., no desiccation,**

**no leakage, with adequate documentation and evidence that the cold chain was**

**maintained.**

## 3.5 Notification of laboratory results

The presence or absence of poliovirus in these specimens will be determined by viral culture. This is very important to demonstrate the continued absence of wild poliovirus proving the Pacific has remained polio-free or to quickly and reliably detect a wild poliovirus imported into the region from an area where it is still circulating.

Laboratory results are normally available from VIDRL within 14 to 28 days. VIDRL will send a copy of the laboratory results to the requesting country/ country laboratory, and a copy to the WHO Division of Pacific Technical Support in Suva. On receipt of the results the country/country laboratory should ensure that both the requesting physician and the National Coordinator are informed.

Members of the Sub-regional Polio Certification Committee (SRCC) will make a final case classification, according to all information at its discard (i.e., initial investigation, 60+day follow-up, clinical evidence, and laboratory information). This Committee is made up of pediatric, laboratory, and other experts from the Pacific Islands and is tasked with ensuring supporting sustaining poliomyelitis eradication. Once finalized, case classification results are forwarded to the National and Hospital Coordinators in the referring country.

## Classification of AFP cases

AFP cases with **adequate** specimens are either:

***Confirmed*** as polio, if wild or vaccine-derived poliovirus was detected in any stool specimens from either the case or contacts

***Discarded*** as non-polio AFP, if no wild or vaccine-derived poliovirus was detected in adequate stool specimens from either the case or contacts.

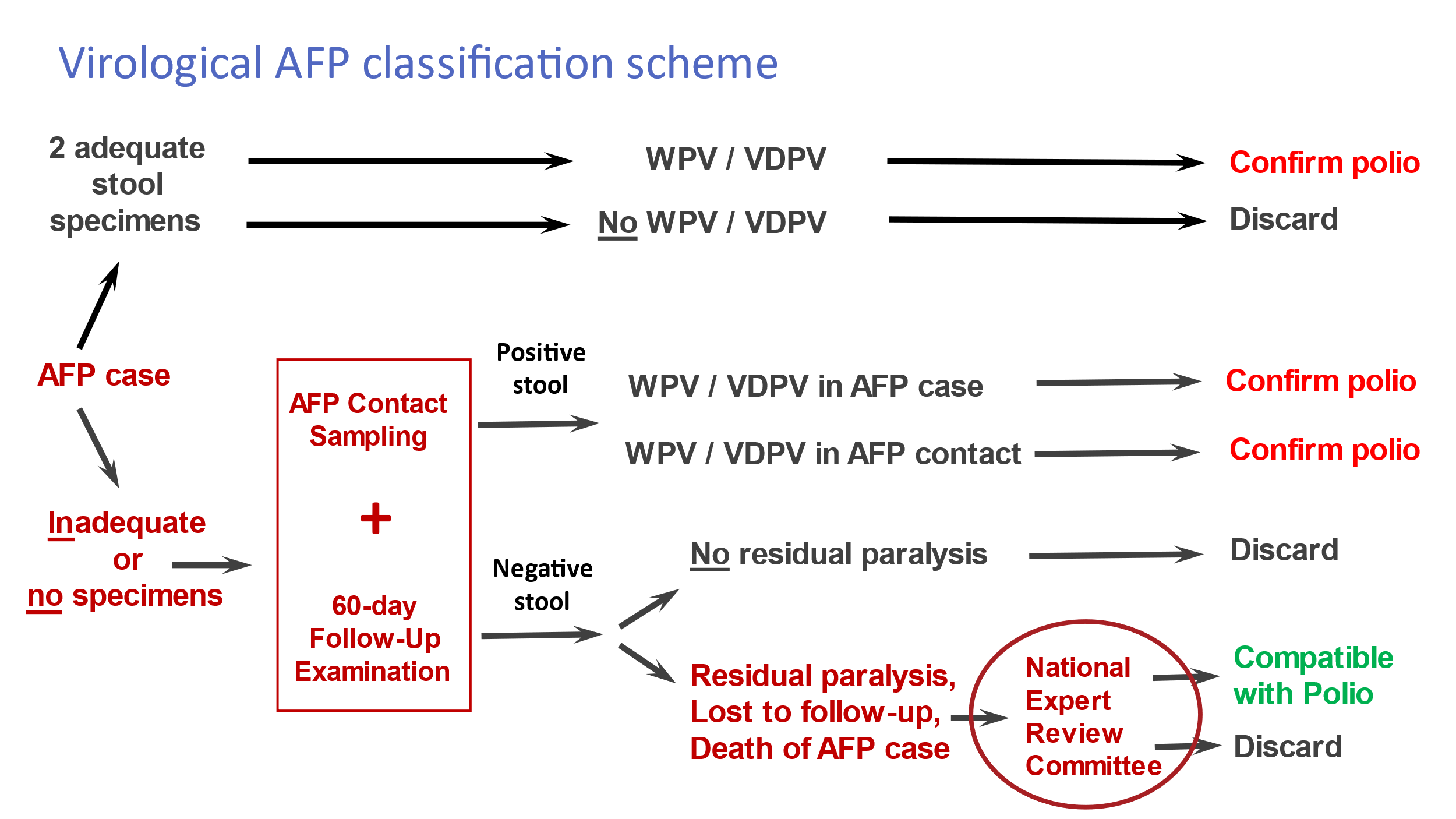
AFP with **inadequate** specimens will be:

***Confirmed*** as polio, if wild or vaccine-derived poliovirus was detected in any stool specimens from either the case or contacts

***Compatible*** if the PSRCC has concluded so after reviewing that (1) no wild or vaccine-derived poliovirus was detected in any stool specimen from either the case or its contacts, and that (2) there is residual paralysis (or weakness) at the time of the 60-day follow-up visit, or that the follow-up was not done due to death or loss to follow-up of the case, and (3) upon review, the possibility of polio could not be ruled out.

***Discarded*** as non-polio AFP, if no poliovirus was detected from the case or his/her contacts, and no residual paralysis was observed at the 60-day follow-up visit of the case, or if the PSRCC concludes after reviewing that (1) no poliovirus was detected in any stool specimens from either the case or contacts, and that (2) even though there was residual paralysis, or the case was lost to follow-up, or had died, there was sufficient evidence (clinical evidence and supportive documentation) to discard the case as non-polio.

Figure 2.: Case classification scheme



## 3.7 AFP Retrospective Record Reviews

Retrospective record reviews of all HBAS reporting sites should be conducted regularly by HC and NC to ensure that no cases of AFP have been missed, and especially so for reporting sites that have lapsed in their report submissions. A summary of these reviews should be provided to WHO for review by the Sub-regional Certification Committee for poliomyelitis. A protocol for conducting an AFP Retrospective Record Review is provided in Annex G.

## 3.8 Indicators used to measure AFP surveillance performance

The following main standard indicators are used globally by the Polio Eradication Initiative to analyze the performance of AFP surveillance systems:

|  |  |  |  |
| --- | --- | --- | --- |
| Core Indicator | Description | Target | |
| Non-polio AFP rate in children < 15 years of age | Number of cases discarded as NPAFP children < 15 yrs. of age/Number of children <15 yrs. of age x 100,00/year | | ≥ 1 / 100 000 |
| % of AFP cases investigated within 48 hours of report | Number of AFP cases investigated within 48 hours/total number of cases investigated | | ≥ 80% |
| % of AFP cases with 2 stools collected > 24 hours apart & less than 14 days of paralysis onset | Number of AFP cases with 2 **stool specimens** collected >=24 hours apart AND <=14 days of onset AND received in good condition‡ in a WHO-accredited laboratory /number of AFP cases) x 100 | | ≥ 80% |
| Stool specimens arriving at the lab within 3 days of being sent | Number of specimens arriving at the laboratory w/in 3 days/total number of specimens dispatched x 100 | | ≥ 80% |
| Stool specimens arriving at the laboratory in "good condition" | Number of stool specimens arrived in good condition/total number of stool specimens arrived at the laboratory x 100 | | ≥ 90% |
| % AFP cases with inadequate stool specimens and 60-day follow-up | Number of cases with inadequate or no stool specimens collected or isolated with Sabin conducted 60-day follow-up/total number of inadequate cases or no stool specimens collected or isolated with Sabin x 100 | | ≥ 80% |

# ACUTE FEVER AND RASH (AFR) CASE INVESTIGATION

## 4.1 AFR case definition

The HBAS system case definition for Acute Fever and Rash is a patient that presents with acute febrile illness with acute **non-vesicular** (**non-blistering**) rash.

## 4.2 Investigating and reporting an AFR case

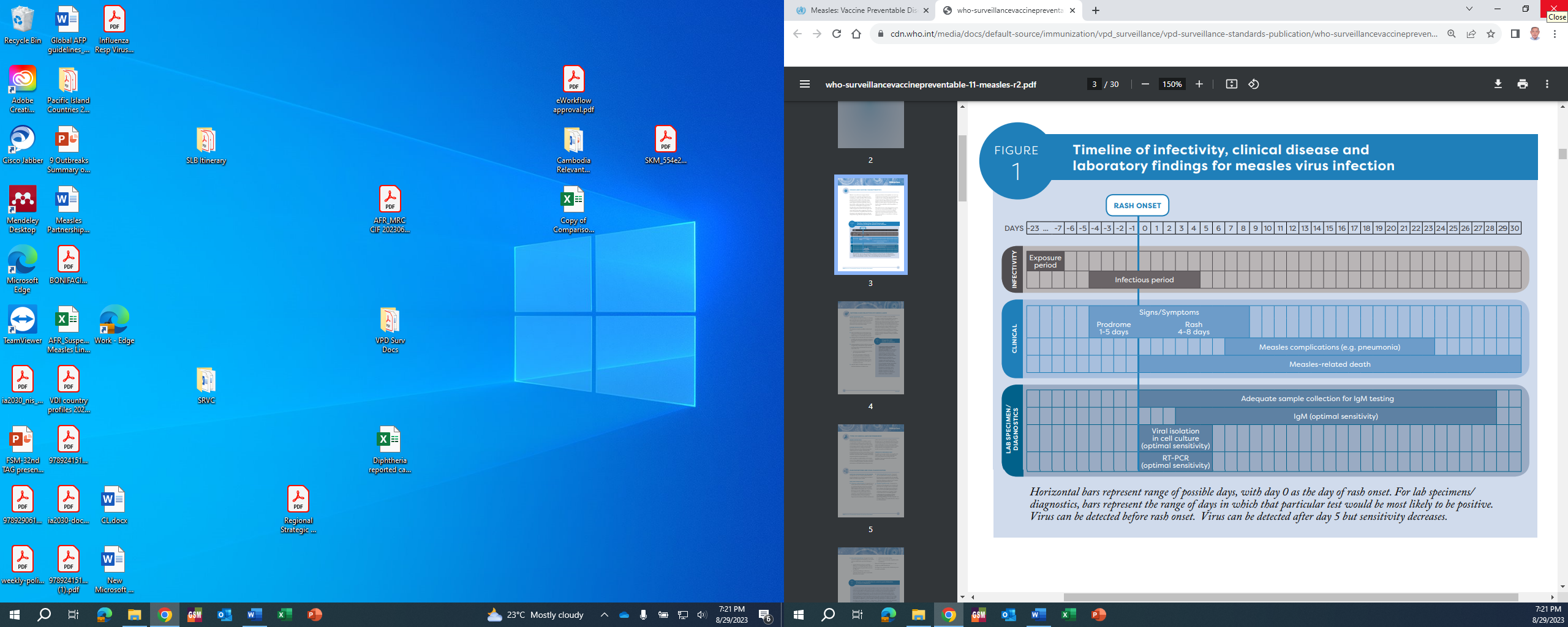
An illness in a patient of any age with fever and generalized maculopapular (non-vesicular) rash, or in a patient who a health care worker suspects has measles should be investigated.

The following differential clinical diagnoses presenting with AFR include Rubella, Dengue, Leptospirosis, Chikungunya, Zika, Drug Reactions, Meningococcemia, or other viral rash, e.g., Parvovirus B19, Coxsackie A, Roseola diseases.

## 4.3 AFR Case Investigation and Specimen Collection

1. Conduct AFR case investigation and complete filling in the investigation form (Annex B2).

* The case investigation form is used for both AFR/suspected measles-rubella. During the initial investigation, it is important to fill in all the questions especially, vaccination history, clinical signs and symptoms, recent travel history, and contact and sample collections.
* Below Figure 3 demonstrates a timeline of infectivity, clinical disease, and laboratory findings for measles virus infection, which would serve as a guide in history taking and filling in of case investigation form (Source: WHO: Surveillance Vaccine Preventable Module 11: Measles, 2018)



1. Establish a team as soon as possible for a follow-up visit at the patient’s home to evaluate the family/friends for evidence of AFR illness or additional cases and to provide immunizations as needed.
2. Tick the “Yes” column in the corresponding Monthly Reporting Form under “AFR” and include relevant identifying details on the reverse side of the form (unless these have been recorded elsewhere).
3. Specimen types for diagnosis of measles and rubella
   1. Antibody detection (measles-specific IgM, paired sera to document IgG seroconversion or a significant rise in IgG between acute and convalescent phase sera). Adequate samples are those collected within 28 days after the onset of the rash

* Blood should be collected by venipuncture into a sterile tube labeled with patient identification and collection date.
  + Five (5) ml for older children and adults and one (1) ml for infants and younger children of blood should be taken at the first contact opportunity with the suspected case.
  + Whole blood should be centrifuged at 1000 x g for 10 minutes to separate the serum;
  + Blood can be stored at +4 to +8oC for up to 24 hours before the serum is separated; Do not freeze whole blood;
  + If there is no centrifuge, blood should be kept in the refrigerator until there is complete retraction of the clot from the serum;
  + Carefully remove the serum, avoiding extracting red cells, and transfer aseptically to a sterile labeled vial;
  + Label the vial with the patient’s name or identifier, date of collection, and specimen type;
  + Sterile serum should be shipped on wet ice within 48 hours or stored at +4 to +8oC for a maximum period of seven days; sera must be frozen at -20 oC for longer periods of storage and transported to the testing laboratory on frozen icepacks. Repeated freezing and thawing can have detrimental effects on the stability of IgM antibodies.
  1. Alternative specimen: Dried Blood Spots (DBS) (Whole Blood) can also be utilized for antibody detection and detection of viral RNA by RT-PCR. At least 3 filled circles on a filter paper collection devise taken < 28 days after rash onset
  2. Throat (Recommended), Nasal, or Nasopharyngeal (NP) Swabs or Nasopharyngeal Aspirates: Viral isolation by cell culture. Detection of viral RNA by RTPCR. Ideally, the sample would be collected within 5 days up until 14 days after onset of rash for virus detection
  3. Oral fluid (OF): Antibody detection (measles specific IgM) Detection of viral RNA by RT-PCR. Ideally, the sample should be collected within 5 days, but can be collected up until 14 days after onset of rash for virus detection. Up to 28 days if antibody testing.
  4. Urine: Viral isolation by cell culture. Detection of viral RNA by RT-PCR. Ideally, the sample should be collected within 5 days but can be collected up until 14 days after the onset of rash for virus detection

## 4.4. AFR Case Notification and Reporting

Case-based reporting and laboratory confirmation on every suspected case are fundamental for monitoring the measles virus during the elimination phase. An in-depth investigation of each suspected case is critical.

On notification of an AFR case, the Hospital Coordinator should:

1. Contact the National Coordinator to notify case details and arrange for necessary assistance with serum sample shipment and ensure that the correct shipping containers are available. If necessary, the National Coordinator can contact the WHO Country Office or WHO Division of Pacific Technical Support in Suva for assistance with serum shipment and containers
2. Ensure that the serum sample is taken for the child/patient and stored at appropriate temperatures until the sample is shipped
3. Ensure that the clinician completes the AFR Case Investigation form (Annex B2) promptly; review the information provided and clarify any missing information before
4. Send a copy of the AFR Case Investigation form to WHO Country Office and WHO Division Pacific of Technical Support in Suva (via the National Coordinator) and file a copy of the form in the reporting sites HBAS folder
5. Ensure that the reporting site is re-supplied with specimen shipment containers from the national coordinator

On notification of an AFR case, the National Coordinator should:

* On receipt of the Case Investigation form, please ensure that the appropriate serum collection containers are available
* Liaise with the country laboratory, WHO offices, and the WHO-accredited Laboratory to ensure that serum sample shipment proceeds smoothly and that required notifications of shipment are received.
* Ensure that the reporting site is re-supplied with serum sample shipment containers from the national coordinator
* The Ministry and WHO to discuss alerting neighboring countries through PacNet and other means if measles-specific IgM and viral RNA are detected and re-confirmed (to avoid sharing information of false-positive cases).

## 4.5. AFR/Measles Contact tracing

Due to its infectious nature, contact tracing and additional case searches are essential to determine both the source of infection for the measles case, as well as identify those whom the case may have subsequently infected to enable timely prevention of further transmission.

Source identification is implemented through contact tracing, identification of index case and their travel history. A contact is anyone who has or may have shared the same airspace for any length of time with a laboratory-confirmed, epidemiologically linked or clinically compatible case where a high index of suspicion of measles exists while the case was infectious (4 days before and 4 days after rash onset).

A list of these contacts with their addresses can be made and then followed up to see whether they have become ill with measles for a period of 21 days form contact date.

Further information on actions to follow if a measles or rubella outbreak is occurring can be found in the WHO Measles Elimination Field Guidelines <https://www.who.int/publications/i/item/9789290616054> and the PPHSN AFR Surveillance Guidelines <https://www.pphsn.net/services/pacific-syndromic-surveillance-system/>.

## 4.6. AFR specimen shipment

1. If the initial clinical suspicion/assessment is that the patient has suspected clinical dengue, testing should be carried out at the L1 level to confirm/rule this out, and if negative, samples should be forwarded for measles/rubella testing
2. If the initial clinical suspicion is measles/rubella, the National/Hospital Coordinator should work with the hospital's laboratory department to ensure that the serum specimens are shipped preferably to the Western Pacific Measles Reference Laboratory at VIDRL or either one of the Pacific Lab Net Level 2 Laboratories in New Caledonia, Guam, Fiji, and French Polynesia without delay. Contact details for the measles lab at VIDRL and all the Pacific Lab Net L2 labs are provided in Annex F2. The countries of the Pacific islands have an efficient referral system
3. Serum samples should be sent in special shipping containers that have been provided by WHO or Country's national laboratory. Packaging and labeling instructions are the same as for AFP samples and are provided in Annex D
4. Serum specimen must be accompanied by an AFR Laboratory Form (Annex C2), and labeled with:
   * Patient’s name and Hospital Number
   * Date of birth
   * Date of onset of fever and rash
   * Date of specimen collection
   * Name of hospital where collected
   * Date of last measles-containing vaccine dose (where applicable)
5. Serum specimens shipped to VIDRL must be accompanied with a Customs declaration letter and customs invoice with a copy of the airwaybill and case investigation form of the patient (templates for the customs declaration and custom invoices are provided in Annex E2 or can be obtained from WHO Division of Pacific Technical Support in Suva, which is filled out by the hospital laboratory. For serum specimens sent to any of the Pacific LabNet L2 laboratories, please ensure appropriate forms are included as advised by the Lab.
6. Before shipping serum specimens to any laboratory, ensure that a pre-alert message is sent and provide details of the Airway Bill Number, Flight Number, and estimated arrival time.
7. In addition, please ensure that copies of the case investigation form, lab request form and shipment details are provided by email a copy to the Division of Pacific Technical Support: WHO South Pacific office in Suva

## 4.7 Indicators of a well-performing surveillance system

|  |  |  |
| --- | --- | --- |
| **Indicators** | **Description** | **Target** |
| Completeness and timeliness of reporting | Proportion of surveillance units reporting measles data to the national level (completeness) and on time (timeliness, e.g., by the 10th of every month). | ≥ 80% for both |
| Reporting rate of non-measles and non-rubella cases | Annual reporting rate of non-measles non-rubella  cases at the national level  Note: all 21 countries as PIC and one epidemiological block | 2 cases per 100,000 population |

|  |  |  |
| --- | --- | --- |
| **Indicators** | **Description** | **Target** |
| Representativeness of case reporting | Proportion of second-level subnational units reporting more than two non-measles non-rubella cases per 100 000 population  **Notes**  (1) Second level is equivalent to “individual country” in the Pacific  (2) If the individual country has a population  < 100 000, then the rate should be calculated  by combining administrative units to achieve a  population of > 100 000, or combining reporting  over a duration of more than one year. | ≥ 80% |
| Adequate case investigation rate | Proportion of suspected cases with investigation  initiated within 48 hours of notification, with  collection of all 10 core variables  **Notes**  (1) The 10 core variables are: case identification, date of birth/age, sex, place of residence, vaccination status or date of last vaccination,  date of rash onset, date of notification, date of investigation, date of blood specimen collection, and place of infection or travel  history.  (2) For any case, if information on any of the core variables is missing, the investigation will be considered inadequate. | ≥ 80% |
| Adequate collection rate for blood specimens | Proportion of suspected cases (excluding epi-linked cases) with adequate specimen collection  **Note**  Adequate specimens are: minimum of 0.5 ml blood sample or dried blood sample with at least three fully filled circles on filter paper collected within 28 days of rash onset. | ≥ 80% |
| Timeliness of specimen transport | Proportion of blood specimens received at the designated laboratory within five days of collection  **Note**  Virus isolation samples should be transported to the laboratory within 48 hours. | ≥ 80% |
| Timeliness of reporting laboratory results | Proportion of results reported by the designated laboratory within four days of specimen receipt  **Note**  This refers to serology results. | ≥ 80% |
| Virus detection | Proportion of laboratory-confirmed measles virus chains of transmission with genotypic data available | ≥ 80% |
| Infection source | Proportion of confirmed measles cases with known source of infection  **Note**  Known sources of infection can be endemic, imported or imported related. | ≥ 80% |

# 5. NEONATAL TETANUS (NT) CASE INVESTIGATION

## 5.1. NT case definition

Any neonate who could suck and cry normally during the first two days of life and developed tetanus-like illness or death between 3 and 28 days of age OR any neonate who died of unknown cause during the first month of life.

## 5.2. Investigating and reporting a NT case

While, the PICs has already achieved MNTE elimination the objective of NT surveillance is to detect cases of NT towards maintaining MNTE, defined as less than one NT case per 1,000 live births annually in every district.

All reported suspected NT case or death should be investigated that meets either of these 2 criteria:

* Any neonate who could suck and cry normally during the first two days of life and developed tetanus-like illness or death between 3 and 28 days of age

OR

* any neonate who died of unknown cause during the first month of life

Each suspected NT case or death should be investigated by trained staff to confirm or discard the case, ideally within seven days of notification. The sooner the mother and persons who attended the birth are visited, the more likely they are to be available and remember relevant details.

It is crucial during the investigation to ascertain why the infant contracted tetanus, such as lack of maternal vaccination, birth unattended or attended by unskilled staff, use of unhygienic cutting tools or application of substances to the umbilical stump.

During case investigation, surveillance staff can use a simplified algorithm to determine if the mother and infant were protected at birth (PAB) against tetanus, based on maternal vaccination history and questioning mother about the number of tetanus toxoid containing vaccine (TTCV) doses she received during last pregnancy and the number of doses she received during school-age, previous pregnancies, or campaigns/outreach occurring any time before the last pregnancy. A birth is protected if the mother received:

* Two TTCV doses during last pregnancy (with second dose given at least 2 weeks before birth)

OR

* One TTCV dose during last pregnancy (given at least two weeks before birth) and one or more doses at any time before the pregnancy

OR

* No dose during the last pregnancy and 3 or more adolescent/adult doses at any time before the pregnancy.

## 5.3. Specimen collection

No specimens are collected for NT/ND cases, as there is no laboratory diagnosis of NT.

## 5.4. Laboratory Testing

Diagnosis of tetanus is entirely based on clinical features and does not depend on laboratory confirmation

## 5.5 Public Health Response

If a clinician sees a case of NT or is informed of a suspected case of NT, they should:

1. Hospitalize for appropriate supportive care.
2. Complete a NT/ND Case Investigation Form (Annex B3). For cases outside the hospital, ensure that health workers at the local and district levels who investigate neonatal tetanus/death cases use a Case Investigation Form to record the case information. It is important that health workers should coordinate through a network of traditional birth attendants, community leaders, or other community members who are sensitized to report NT cases and deaths to health authorities
3. Make sure that the “Yes” column in that month’s HBAS Monthly Reporting Form is ticked appropriately, and that relevant identifying details of the case are provided on the reverse side of the form
4. Work with Public Health staff to assess community risk and increase immunization efforts as indicated. Identify problems with TT immunization services, delivery practices, umbilical cord care, and possibly vaccine potency (e.g., freezing of vaccine)
5. At a minimum, give 2 doses of TTCV to the mother of the case and other unprotected women of childbearing age who live near where the case occurred, according to their immunization status. Observe the 4-week interval between the 2 doses
6. Consider adding health education about NT for women of childbearing age and pregnant women in coordination with other Maternal and Child Health Services

## 5.6 Indicators used to measure NT surveillance performance

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **Description** | **Target** | **Formula** |
| Completeness of reporting | Percentage of designated sites  reporting NT data, even in the absence of cases (zero reporting) | ≥ 90% | # Sites reporting NT /  # Designated reporting sites for NT surveillance x 100 (for a given time- period) |
| Timeliness of reporting | Percentage of designated sites  reporting NT data on time, even in the absence of cases (zero  reporting) | ≥ 80% | # Of surveillance units in the country reporting by the deadline / # of  designated reporting sites for NT surveillance x 100 |
| Completeness of investigation | Proportion of NT suspected cases that have been investigated  (Only among cases reported from health facilities) | ≥ 90% | # Of NT case investigations / # of  suspected NT cases reported x 100 |
| Timeliness of investigation | Percentage of all suspected cases  investigated within 7 days of notification | ≥ 80% | # Suspected NT cases investigated within 7 days of notification /  # Suspected NT cases investigated x 100 |
| Adequacy of investigation | Percentage of investigated suspected  cases with complete information for all core variables | ≥ 80% | # Of suspected NT cases for which an adequate investigation was completed with collection of 12  core variables / # of suspected NT cases investigated x 100 |
| Achievement and Maintenance of MNTE (% of districts with < 1 NT case per 1,000 live births) | Percentage of districts with < 1 NT case per 1 000 live births | ≥ 100% | # Districts with < 1 NT case per 1 000 live births / total # districts x 100 |
| Adequate case response (% of confirmed NT cases for which the mother received TTCV dose in conjunction with case detection or investigation | Percentage of confirmed NT cases  for which the mother received a TTCV dose in conjunction with  case detection or investigation | ≥ 100% | # Of mothers of NT cases that received a TTCV dose in conjunction  with case detection or investigation / total # of NT case investigations  x 100 |

## 5.7 Special consideration for neonatal tetanus surveillance:

Neonatal Death Survey:

The relative contribution of NT to neonatal mortality can be assessed through audits of neonatal deaths at health facilities or in community settings (refer document: Making every baby count: audit and review of still births and neonatal deaths) and implemented in some countries as part of Every *Newborn: an action plan to end preventable deaths*. (Available here: http://www.who.int/maternal\_child\_adolescent/newborns/every-newborn/en/).

Moreover, in some countries, activities in sentinel communities may approach or achieve real-time reporting of neonatal deaths and attempts should be made to link NT case detection to investigation through case-based surveillance.

# 6. VPD SURVEILLANCE & SELECTED PRIORITY VPDS

The HBAS has been mainly focusing on polio eradication followed by measles and MNT elimination surveillance since 1997. However, this section will address VPD surveillance objectives, priorities, integration, and selected priority VPDs as per the country's epidemiology and local context. Therefore, countries should report other priority VPDs through this HBAS system (e.g. rubella, diphtheria, pertussis).

The prevention, control, and elimination of vaccine-preventable diseases, which has long been a priority for WHO and member states in WPRO since 1974. During the last three decades, the WHO Regional Committee (RC) for the Western Pacific Region (WPR) has taken decisive action to eradicate poliomyelitis (1988), eliminate measles (2003), and accelerate the control of hepatitis (2003). In 2014, the RC endorsed the Regional Framework for the Implementation of the Global Action Plan (2011-20) in WPRO and specified eight regional immunization goals (1) sustaining polio-frees tatus (2) maternal and neonatal tetanus elimination; (3) measles elimination; (4) rubella elimination; (5) accelerated control of hepatitis B;(6) accelerate control of Japanese encephalitis; (7) introduction of new vaccines; and (8) and meeting regional vaccination coverage reports.

As progress and significant achievements have been observed during the past decades in strengthening immunization systems and programs, eliminating several VPDs and introducing new vaccines, the WPRO have an opportunity to expand scope of immunization and VPD control and elimination to save more lives thus improving global and regional public health and one of the three strategic objectives is managing health intelligence on VPD and immunization with four strategies (1) enhancing strategic use of epidemiologic intelligence though optimized and integrated VPD surveillance system; (2) ensuring prompt detection, confirmation and characterization though integrated VPD laboratory capacity and networks; (3) generating quality data for ensuring continuous improvement of immunization program and strengthening of overall health system and; (4) driving evidence-based decision making and action for immunization and disease control elimination (Regional Strategic Framework for VPDs and Immunization in WPRO 2021-2030).

After considering the regional strategic framework for VPD and Immunization, each country program should outline its key objectives for each disease under surveillance as an integral part of surveillance prioritization and design. The objectives of a surveillance system should dictate its design and not vice versa. VPD surveillance has several principal objectives, common examples outlined below.

## 6.1 VPD Surveillance Objectives

|  |  |  |
| --- | --- | --- |
| **Surveillance objective** | **Key Characteristics** | **Examples** |
| * + - 1. Monitoring disease elimination or eradication efforts | Detection of all cases, risk factors, molecular epidemiology | Polio eradication, measles, rubella, and neonatal tetanus (NT), hepatitis B-mother to child transmission elimination |
| 2. Detection of outbreaks and new pathogens | Clusters of VPD, unusual or rare strain identification | Meningococcal outbreaks, pandemic or highly virulent influenza virus and C-19 |
| 3. Evidence for new vaccine introduction or optimizing vaccine schedules | VPD epidemiology, trends and VPD surveillance | Pneumococcal, rotavirus disease burden for vaccine introduction decisions, changing schedules for tetanus or pertussis vaccine |

|  |  |  |
| --- | --- | --- |
| **Surveillance objective** | **Key Characteristics** | **Examples** |
| 1. Evaluation of immunization program performance and defining the need of supplementary immunization (SIA) | Characterize gaps in immunization program and epidemiologic partners of cases (i.e., age, geographic location) | Vaccination history of measles can help identify geographic areas and age groups with low vaccination coverage to inform targeting of future measles vaccination campaign |
| 1. Vaccine effectiveness, impact on disease burden or both | Trends in VPD case counts p-re and post-vaccine introduction | Test negative case-control vaccines effectiveness |
| 1. Changes in disease strains or types | Molecular or serologic characterization of cases | Seasonal influenza vaccine formulation, pneumococcal serotype replacement after pneumococcal conjugate vaccine (PCV) introduction |

## 6.2 Prioritization of VPD Surveillance

The decision to undertake surveillance is considered primarily whether surveillance data will inform policy and strategic decision makers and secondly consider resource questions whether surveillance objectives be met by using existing integrated surveillance platforms with minimal additional resources or disease-specific surveillance required (i.e., poliomyelitis, measles) and is there adequate technical capacity or adequate funding.

In some countries with limited resources and capacity, may require the country to prioritize surveillance for some VPD and not others. The following are criteria for prioritizing communicable disease surveillance, including VPD

* Disease burden and endemicity (natural level of disease occurrence)
* Severity and case fatality ratio
* Epidemic potential
* Potential for emergence of virulence or changing pattern of disease
* Prevention and control, and elimination potential
* Social and economic impact
* International reporting regulations, such as International Health Regulations
* Public perception of risk h logistical feasibility (for example, syndromic surveillance already exists

## 6.3 Selected Priority VPDs for surveillance and reporting

* + 1. Rubella

Rubella virus is an RNA virus in the genus Rubi virus, within the togavirus family. There are 13 known rubella virus genotypes and one serotype. Rubella is an acute viral disease traditionally affecting susceptible children and young adults and self-limiting.

It can cause serious complications during pregnancy in non-immune women, including miscarriage, stillbirth, premature delivery, and a spectrum of severe birth defects called congenital rubella syndrome (CRS). Hence, CRS is of public health importance and has a surveillance system and management.

During the second week after exposure, there may be a prodromal illness consisting of fever, malaise, and mild conjunctivitis. Prodromal symptoms are more common in adults than children. Postauricular, occipital and posterior cervical lymphadenopathy is characteristic, and typically precedes the rash by 5–10 days. The maculopapular, erythematous and often pruritic rash occurs in 50–80% of rubella-infected persons. The rash, usually lasting one to three days (unlike measles which could last 4-8 days), starts on the face and neck before progressing down the body, usually milder than measles rash. Joint symptoms (arthritis, arthralgias), usually of short duration, may occur in up to 70% of adult women with rubella but are less common in men and children.

Rubella surveillance should be linked with measles surveillance with the same definition.

* + 1. Diphtheria

Is an acute communicable upper respiratory illness mainly caused by a toxin produced by Corynebacterium diphtheria. The disease primarily affects the respiratory tract and skin and occasionally mucous membranes at other sites, i.e., genitalia and conjunctiva. Transmission is most often spread from person to person from the respiratory tract. The toxin characteristically causes the formation of a pseudo membrane in the upper respiratory tract. Acute respiratory obstruction, acute systemic toxicity, myocarditis, and neurologic complications are typical causes of death from diphtheria.

Clinical Description

* An illness characterized by laryngitis OR pharyngitis OR tonsillitis AND an adherent

membrane of the tonsil, pharynx, and/or nose

Laboratory Criteria for Diagnosis

* Isolation of Gram + Corynebacterium diphtheria bacteria from a clinical sample OR four-fold increase in serum antibody (but only if both serum samples are obtained before administration of diphtheria toxoid or antitoxin)

Case classification

* Suspected Not applicable
* Probable which meets clinical description
* Confirmed which is confirmed by laboratory or linked with a laboratory confirmed case

6.3.3 Pertussis

It is caused by Bordetella pertussis, a highly infectious, vaccine-preventable bacterial disease of the respiratory tract that predominantly affects infants and children. It is endemic in all countries. Following an incubation period of seven to 10 days, symptoms include mild fever, runny nose, and a cough. After the initial two weeks of symptoms, the cough typically develops into a characteristic pattern of prolonged coughing fits followed by a high-pitched whooping noise on inspiration. This is known as the paroxysmal phase, which can last four to eight weeks in duration. During the initial two to three weeks of coughing symptoms, the infection is highly transmissible.

Pertussis is one of the leading causes of vaccine-preventable deaths worldwide, particularly affecting infants (CFR around 4%) and young children below the age of 5 years (CFR around 1%). Pneumonia with high mortality is the most important complication associated with pertussis.

**Clinical Description**

* Any case diagnosed as pertussis by a physician **OR a** person with cough lasting at least two weeks with at least one of the following symptoms
  + Paroxysms or burst of coughing
  + Inspiratory whooping
  + Post-tussive vomiting (vomiting immediately after coughing) without other apparent cause
  + The diagnosis of pertussis is based on a clinical history of signs and symptoms, as well as a variety of laboratory tests (e.g., culture, polymerase chain reaction [PCR], and serology). However, fastidious growth requirements make B. pertussis difficult to culture
  + Three stages: catarrhal, paroxysmal, and convalescent

**Laboratory Testing**

* + The diagnosis of pertussis is based on a clinical history of signs and symptoms, as well as a variety of laboratory tests (e.g., culture, polymerase chain reaction [PCR], and serology)
  + However, fastidious growth requirements make B. pertussis difficult to culture

**Note**: For reporting and notification, it is the same process as other VPDs mentioned above. However, it is found that some countries may not have case investigation forms of several VPDs, therefore, countries may develop a form or collect a generic form from the WHO.

# References:

1. GPEI: Global Guidelines for Acute Flaccid Paralysis (AFP) and Polio Surveillance
2. Measles Elimination Field Guide: WHO-WPR, 2013
3. Overview of VPD Surveillance: WHO 2018
4. Global strategy for comprehensive Vaccine-Preventable Disease (VPD) surveillance: <https://www.who.int/publications/m/item/global-strategy-for-comprehensive-vaccine-preventable-disease-(vpd)-surveillance>
5. Strategic Action Plan on Polio Transition. Geneva: WHO; 2018 (<https://www.who.int/polio-transition/strategic-action-plan-on-polio-transition-may-2018.pdf>).
6. Measles and Rubella Strategic Framework 2021-2030

# Annexes

## Pacific HBAS Monthly Reporting Form (4)\_Annex A

## Case Investigation Forms (2.1 AFP, 2.2AFR and 2.3NT)\_Annex B1, B2 and B3

## Laboratory Request Forms (5.1 AFP and 5.2AFR)\_ Annex C1 and C2

## AFP/AFR Specimen Packaging and Shipment Instructions (5.3)\_Annex D

## Australian Customs and Quarantine Declaration (5.1.1 AFP, 5.2.1 AFR) Annex E1 and E2

## Contact Details-WHO, PPHSN, VIDRL & LabNet L2 Laboratories\_ Annex F1 and F2

## AFP Retrospective Record Review Protocol (3)\_Annex G