



AIDE MEMOIRE

An **adverse event following immunization (AEFI)** is a medical incident that takes place after an immunization, causes concern and is believed to be caused by the immunization. Programmes providing immunization services should include a **system for AEFI detection and reporting, investigation and management, data analysis, corrective action, relevant communication and evaluation of the system.**

The ultimate **goal** of an investigation is to determine whether the vaccine or immunization process is responsible for the reported event(s) or to find another and correct it if possible, and reassure the public.

There are 4 possible causes of AEFI:

Vaccine reaction: event caused by some component of the vaccine – the active component of the vaccine itself, the preservative, the stabilizer or other. The majority of vaccine reactions are “common” and expected, mild, settle without treatment and have no long-term consequences. More serious reactions are very rare – usually of a fairly predictable (albeit extremely low) frequency;

Programme error: event caused by error in vaccine preparation, handling or administration;

Coincidence: event where something happens after the immunization but is not caused by the vaccine or the programme; and

Injection reaction: event arising from anxiety about the injection (needle).

The **purposes of investigating AEFI** cases are:

- 1) to confirm a reported diagnosis of AEFI and clarify the details and outcome;
- 2) to determine whether unimmunized persons are experiencing the same medical event(s);
- 3) to investigate the link between the vaccine given and the AEFI ;
- 4) to determine the contribution of operational aspects of the programme to the reported AEFI;
- 5) to determine whether a reported event was isolated or part of a cluster;
- 6) to determine the cause of the AEFI so as to provide the best intervention/medical care and take any further action deemed necessary.

In most cases, a preliminary **investigation** of an AEFI can be made by the health worker who detected the case, e.g. a health centre staff member or a nurse or physician in a hospital.

Serious AEFI cases or **AEFI clusters** should be investigated immediately with involvement from central levels including epidemiological and/or clinical expertise. A cluster of AEFIs can be defined as two or more cases of the same adverse event related in time, place or vaccine administered.

Inadequate planning or response may lead to a crisis with loss of confidence in the vaccination service. It is essential that programme managers:

- 1) **anticipate** the crisis and be prepared to deal with it when it occurs;
- 2) **verify** the facts of any event before making any public statement;
- 3) **are familiar with a plan** for reacting to any crisis should it happen. If no plan exists programme managers should develop one;
- 4) **be well informed** so that appropriate national and regional managers can be rapidly briefed to take charge and deal with political and media enquiries.



Checklist

1. Be prepared

- Read the resource documents on reporting, management and investigation of AEFIs.
- Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures.
- Designate and train staff to conduct an AEFI investigation using the investigation form.
- Train staff on how to collect specimens.
- Establish procedure, criteria and designated person for notifying WHO and UNICEF (if UN- supplied vaccine) or other relevant party depending on procurement mechanism
- Establish a National Technical Advisory Committee with representation from major medical organizations
- Identify a spokesperson for public communications.

2. Receiving a report

- Ensure immediate reporting of most serious events and rapid attention to reports received
- Verify the information in the report and classify and assess the AEFI using established case definitions. Decide whether it needs further investigating.
- If investigation is warranted, travel to the location of the AEFI, or delegate responsibility to another trained person

3. Investigate and collect data

- Ask about the patient
- Ask about the vaccine and other drugs potentially received
- Ask about other vaccinees
- Ask about immunization services
- Observe the service in action
- Ask about cases in unvaccinated persons
- Establish a more specific case definition if needed
- Formulate a hypothesis as to what caused the AEFI

Collect specimens if appropriate:

- from the patient
- the vaccine (and diluent if applicable)
- the syringes and needles

4. Dispatch specimens to appropriate testing facility (laboratory, regulatory authority, etc.)

5. Analyze the data

- Review epidemiological, clinical, and laboratory findings
- Summarize and report findings

6. Take action

- Communicate with health staff
- Communicate findings and action to the parents and public
- Correct problem (based on the cause) by improving training, supervision, and/or distribution of vaccines/injection equipment
- Replace vaccines if indicated

Key data to be collected

1) Data on each patient

- demographic data about patient, including a unique case number, age, sex, place of residence, family history;
- history of patient's present illness - symptoms and when each appeared and its duration, treatment, outcome, diagnosis;
- history of patient's past illnesses e.g., reactions to previous vaccine doses, drug allergies;
- pre-existing disorders, current medications;
- immunization history - vaccine, number of doses received, date, and place of last immunization or immunizations, mode and site of administration;
- laboratory results about blood, stool, or other samples, if appropriate and available
- full autopsy report with toxicological screening and histopathological analysis
- look for common environmental exposures between patients.

2) Data about the vaccine(s) (and diluent if applicable) administered to the patient

- Lot number(s)
- Expiry date(s)
- Manufacturer(s)
- Vaccine storage
- Identify where the vaccine(s) was distributed
- Whether other children were immunized with same lot or same vial at same session and elsewhere
- Results of procedures to control vaccine quality
- Laboratory test results about vaccine, if appropriate.

3) Programme-related data.

- Common practices in storing and handling vaccines, and vaccine administration in the health centre in which the suspected immunization (or immunizations) were given. This may help identify products mistakenly used instead of vaccine or diluent

4) Background data

- Establish if cases have been reported from elsewhere and actively look for additional cases among other vaccinees and at large in the community

Role of the district/regional manager

1) Training

Staff should be trained in diagnosing, treating and reporting of AEFIs, and differentiating between mild, non-significant reactions and more serious events.

2) Supervision

Non-serious AEFIs (e.g. abscesses) reported by peripheral health workers should be reviewed with training during site visits.

3) Investigation and collection of data

Following a report of a serious AEFI, the manager should be responsible for investigation, collection and reporting of data. This may be under the overall supervision of a national team.

4) Communication

The manager or designated person should set up the means for continuous communication between health workers and the community, directly and through the media. The public should be informed frequently about what is being done during an investigation and reassured where necessary.

5) Correction of the problem

If an AEFI was caused by programme error the actions to be taken will probably include one or more of the following:

- **Logistics**
Improving logistics will be the appropriate response if programme errors can be traced to the lack of appropriate supplies or equipment, or to a failure in the cold chain.
- **Training**
Solving operational problems through training will deal with lack of skills and knowledge and with poor attitude.
- **Supervision**
Regular supervision and intensified when needed e.g., problems detected in reporting or programmatic errors identified.

Did the vaccine or its delivery cause the reactions?

It will be necessary to determine if there is a causal association between the vaccine and the adverse event. In each case the following should be considered:

Consistency of findings – are all reported AEFIs the same?

Temporal sequence – confirm that the symptoms of AEFI occurred only after, not before, the vaccine was given and if the vaccine-event interval is compatible with a vaccine reaction

Biological plausibility – does the medical event seem plausibly due to an effect of the vaccine or other concomitant or preceding conditions?

Previously known reaction – check if this type of reaction is known to be related to the vaccine and with which frequency

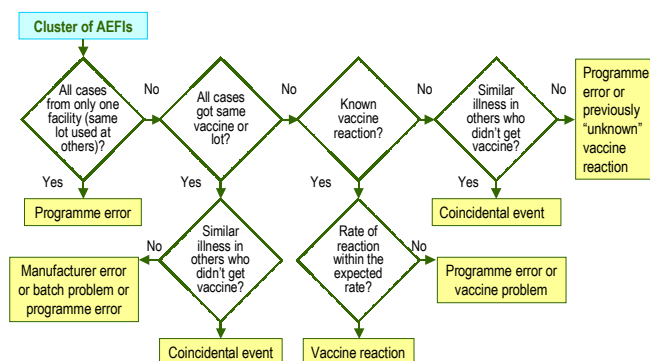
Specificity and strength of association – establish if the same events are being reported in unvaccinated persons and if so, how often and if the cluster is limited to one health center or not

Concomitant or preceding conditions

AEFI evaluation requires a 2 by 2 table of exposures and outcomes and data should be collected in order to more fully complete the table and calculate a risk of event from receipt of the vaccine i.e. $(a/a+c)/(b/b+d)$. Cell a represents case reports only

	Possible Adverse Event	No Adverse Event
Vaccinated	a	c
Unvaccinated	b	d

Suggested steps for the identification of the most likely cause of a cluster of AEFIs



Words of advice

- The investigation should start within 24 hours of notification
- There is seldom need to test the vaccine unless clearly indicated by the epidemiologic investigation, but cold chain should be maintained
- A national committee can be very helpful in reviewing the outcome of the investigation and communication of findings
- Access medical files
- Rule out alternative aetiologies than the vaccination. The fact that an adverse event of the same nature has been previously related to a particular vaccine does not always mean that the case under investigation is also related to the vaccine
- Have direct discussions with the patients or parents if possible

Additional information on the definitions, monitoring, management and investigation of AEFIs can be found on the World-Wide Web at www.who.int/immunization_safety/en

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