
AEFI

Adverse Event Following Immunization

Surveillance and Response OPERATIONAL GUIDELINES



Ministry of Health and Family Welfare
Government of India
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K. SUJATHA RAO
Health & FW Secretary
Tel.: 23061863 Fax: 23061252
e-mail: secyhfw@nic.in



भारत सरकार
स्वास्थ्य एवं परिवार कल्याण
विभाग, नई दिल्ली-110011
GOVERNMENT OF INDIA
MINISTRY OF HEALTH & FAMILY WELFARE
NIRMAN BHAVAN, NEW DELHI-110011

Foreword

Universal Immunization Programme is one of the largest vaccination programme in the world; there are 2.7 crore children and 3.0 crore pregnant women eligible for receiving the primary series of vaccines in the country. In order to reach these beneficiaries, around 8-9 lakh sessions are conducted every month across the country both in rural as well as in urban areas with over crores of doses of vaccine being administered. The 700,000 villages in the country are mostly covered through outreach approach. Therefore, it is evident that monitoring of the Adverse Events Following Immunization (AEFI) in the country is a challenging task nonetheless essential.

The AEFI Surveillance System in the country has come a long way since its inception in 1986. Intensive efforts are being made by Government of India to strengthen Surveillance and Monitoring of AEFI in the country and facilitated in establishing State and District Level AEFI committees were established to streamline the AEFI Surveillance and Monitoring System. National and State Level workshops were conducted by Ministry of Health & Family Welfare further to intensify the system.

I am happy that the Operational Guidelines for Surveillance and Response to AEFI have been revised incorporating the lessons learned. These guidelines will enable the health system to effectively respond to any AEFI in the field by clearly defining the roles and responsibilities of the various health staff. These AEFI guidelines are meant to provide tools for the field functionaries to enable them to detect, report and monitor the adverse events in a timely manner as well as help to prevent AEFIs due to programme errors.

This document would further strengthen the AEFI Surveillance and Response System in the country and would help build public confidence in the immunization programme. These guidelines reinforce the commitment of the Govt. of India to provide safe immunization services in the country.

(K. Sujatha Rao)



National Rural Health Mission



AMIT MOHAN PRASAD, IAS

Joint Secretary

Tel.: 23061195 Fax: 23061842

e-mail: am.prasad@nic.in



भारत सरकार
स्वास्थ्य एवं परिवार कल्याण
निर्मण भवन, नई दिल्ली-110011
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Preface

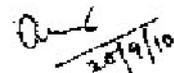
Universal Immunization Programme aims vaccinating 2.7 crores children's and 3.0 crores pregnant women, being the largest cohort of eligible beneficiaries in the world. The services are provided through network of fixed centres and outreach session covering urban and rural areas with reach to every village in the country. Monitoring AEFI and executing such large scale program correctly with diverse and large geographical areas is a challenge to gain the public confidence.

In order to ensure the safety and efficacy, vaccines are being pre-tested every batch before release for public use. However, due to intrinsic property of the vaccine and its constituents like stabilizers, adjuvant, antibiotics, diluents etc. added to the vaccine, some of the individuals may be hyper-sensitive to one component or other and can manifest as Adverse Event Following Immunization (AEFI). Such incidents are rare but may become apparent in terms of number when vaccinating large cohort. AEFI could also be due to programmatic errors as a result of inappropriate storage, improper handling, preparation and administration etc.

It is extremely important that these AEFIs are reported, investigated and treated at the earliest. They will not only build the public confidence but will also prevent additional clustering of cases if due to programmatic error. Quick response in case of AEFI is extremely important. Government of India has been making efforts to strengthen the AEFI Surveillance System in the country through constitution of AEFI committees at National, State and district levels.

In order to strengthen the system further, the National AEFI Guidelines, which were released in 2005, have been revised based on the field experience and development in the field. This revised Operational Guidelines for Surveillance and Response to Adverse Events Following Immunization (AEFI) enable the health system to detect, report and monitor the adverse events in a timely manner as well as help to prevent AEFIs due to programme errors.

It is fervently hoped that this document will guide the program managers at all levels to further strengthen the AEFI surveillance system in the country.


2019/10

(Amit Mohan Prasad)

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Abbreviations

AC	Assistant Commissioner
AEFI	Adverse Event Following Immunization
AE	Adverse Event
AFP	Acute Flaccid Paralysis
AIMS	All India Institute of Medical Sciences
ANM	Auxiliary Nurse Midwife
BCG	Bacillus Calmette-Guerin
CDSCO	Central Drug Standard Control Organization
CHC	Community Health Center
Commissioner FW	Commissioner Family Welfare
CMO/ CS	Chief Medical Officer/ Civil Surgeon
DCG (I)	Drug Controller General of India
DF	Deep Freezer
DIO	District Immunization Officer
DIR	Detailed Investigation Report
DM&HO	District Medical and Health Officer
DT	Diphtheria-Tetanus vaccine
DPT	Diphtheria -Pertussis (whole-cell) -Tetanus vaccine
EPI	Expanded Programme on Immunization
FDA	Food & Drugs Administration
FIR	First Information Report
Gol	Government of India
HA	Health Assistant
Hep B	Hepatitis B vaccine
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
ICD 10	International Classification of Diseases 10th edition

ILR	Ice Lined Refrigerator
MO I/C	Medical Officer Incharge
MoHFW	Ministry of Health & Family Welfare
MO (PHC)	Medical Officer (Primary Health Center)
NCDC	National Centres for Disease Control
NCL	National Control Laboratory
NRA	National Regulatory Authority
OPV	Oral Polio vaccine
PHC	Primary Health Center
PIR	Preliminary Investigation Report
RIIT	Regional Investigation Team
SC	Sub Center
SEPIO	State Immunization Officer/State EPI Officer
SRA	State Regulatory Authority
SOPs	Standard Operating Procedures
TT	Tetanus Toxoid vaccine
UHC	Urban Health Center
UIP	Universal Immunization Programme
UNICEF	United Nations Children's Fund
UT	Union Territory
VAPP	Vaccine-Associated Paralytic Poliomyelitis
VPD	Vaccine Preventable Disease
VVM	Vaccine Vial Monitor
WHO	World Health Organization

Glossary

Adverse event following immunization (AEFI): A medical incident that takes place after an immunization causes concern and is believed to be caused by immunization.

AEFI surveillance: monitoring, detecting and responding to adverse events following immunization (AEFI); Implementing appropriate and immediate action to correct any unsafe practices detected through the AEFI surveillance system, in order to lessen the negative impact on the health of individuals and the reputation of the immunization programme.

Causal association/ link: An AEFI which is caused by administration of a particular vaccine. Causally associated events are also temporally associated, but events which are temporally associated may not necessarily be causally associated. Causality is usually based on Laboratory findings (e.g. isolation of vaccine virus strain), and/or Unique clinical syndrome (e.g. anaphylaxis), and/or Epidemiological studies showing an increased incidence in vaccinated groups as compared with unvaccinated groups.

Cluster: Two or more cases of the same or similar events, which are related in time, and have occurred within specific geographical area, or associated with the same vaccine, the same batch number or the same vaccinator.

Coincidental adverse event: A medical event that occurs after immunization but is not caused by the vaccine. This is due to a chance temporal association.

Immunization safety: Includes vaccine safety and quality, Safe injections and waste disposal and AEFI surveillance.

Injection safety: Injection safety is the safe handling of all injection equipment, routine monitoring of the availability and use of safe injection equipment, and correct disposal of contaminated injection equipment.

Live viral vaccines (e.g. poliomyelitis, measles) contain attenuated (weakened) version of the disease -causing virus. The vaccine virus causes a mild infection, usually with no or minimal symptoms, that creates immunity against that virus.

Non serious AEFI: A reaction that is not “serious”.

Programme Error: An event caused by an error in the transportation, storage, handling, or administration of vaccine.

Serious AEFIs: AEFIs that are life threatening and those that result in hospitalization, disability or death.

Temporal association: If the putative (presumed) causal event precedes the onset of the suspected adverse event then they are temporally associated. Temporal association is independent of causal association, and an event which is temporally associated with vaccine administration may or may not be caused by the vaccine.

Trigger event: A medical incident that stimulates a response, usually a case investigation.

Vaccine: Biological substance that is administered to individuals to elicit immunity (protection) against a specific disease. Combination vaccines (e.g. DTP) protect against more than one disease.

Vaccine reaction: An event caused or precipitated by the active component or one of the other components of the vaccine (e.g. adjuvant, preservative or stabilizer). This is due to inherent properties of the vaccine.

Chapter 1

Introduction

An adverse event following immunization (AEFI) is defined as a medical incident that takes place after immunization, causes concern and is believed to be caused by immunization



Some AEFIs are inevitable, however its impact can be minimized by providing quality immunization services, appropriate case management and communication strategies.

Health care providers at all levels should be equipped with technical and communication skills to address public concerns about vaccination and respond rapidly, clearly and effectively to protect the beneficiaries and preserve the integrity of the immunization programme.

AEFI surveillance monitors immunization safety, detects and responds to adverse events following immunization; corrects unsafe immunization practices, reduces the negative impact of the event on health and contributes to the quality of immunization activities.

Immunization safety has a wide spectrum ranging from vaccine manufacturing & regulation, vaccine safety & quality, safe injections & waste disposal and AEFI surveillance.

Presently this guideline is mainly related to AEFI cases related to vaccines included in the National Immunization Programme. Issues of

AEFI

vaccine manufacturing, safety & quality control and AEFI cases are handled by the Central Drug Control Standards Organization (CDSCO), headed by the Drug Controller General of India (DCG (I)). National Immunization Programme vaccines are those approved vaccines, for which license to its manufacture is issued by the State Licensing Authority. For new vaccine, manufacturers have to furnish Periodic Safety Update Reports (PSURs) to the CDSCO every six months for the first two years and then annually for next two years as per Drugs and Cosmetics Rules . The National Pharmacovigilance Center, at All India Institute of Medical Sciences (AIIMS), which is assisting CDSCO to detect, assess and prevent adverse drug reactions in humans by monitoring effects, assessing risks & benefits, providing information and monitoring the impact of any action taken. Post-marketing surveillance (PMS) is the practice of monitoring a vaccine after it has been released on the market. AEFI surveillance needs to be sustained by the health care providers at all levels.

Safe injections, vaccine vials in cold-chain and waste disposal are managed at the immunization session site by the service provider as per the guideline laid down by the Immunization Division of Ministry of Health & Family Welfare (MoHFW) and Central Pollution Control Board/ Pollution committee,

These AEFI surveillance guidelines provide information to program managers at national, state, district, block and PHC levels on establishing a sensitive AEFI surveillance system capable of detecting, notifying, investigating and responding to an AEFI for vaccines supplied by Government of India. It also briefly outlines a communication strategy on immunization safety to respond to inquires by the public and media.

Chapter 2

AEFI – The Basics

The majority of events thought to be related to the administration of a vaccine are actually not due to the vaccine itself - many are simply coincidental events, others are due to human, or programme error.

AEFIs can be classified into five types (Table 2.1)

1. Vaccine Reaction
2. Program error
3. Coincidental reactions
4. Injection reaction
5. Unknown

Table 2.1: Types of AEFIs

Type	Definition	Example
	Vaccine reaction An event caused or precipitated by the active other component or one of the components of the vaccine (e.g. adjuvant, preservative and stabilizer). This is due to the inherent properties of the vaccine.	<ul style="list-style-type: none"> • High grade fever following DPT vaccination • Anaphylaxis
	Program Error An event caused by an error in vaccine preparation, handling or administration.	Bacterial abscess due to un-sterile injection / wrong diluent
	Coincidental An event that occurs after immunization but is not caused by the vaccine. This is due to a chance temporal association	Pneumonia after oral polio vaccine administration
	Injection Reaction Event caused by anxiety about, or pain from the injection itself rather than the vaccine	Fainting spell after immunization
	Unknown The cause of the event cannot be determined	Does not fit into any of the above four types

AEFI

2.1 Types of AEFI

2.1.1 Vaccine Reaction

Most vaccine reactions are minor and settle on their own. More serious reactions are very rare and in general do not result in long term problems. An ideal vaccine maintains reactions to a minimum while producing the best possible immunity. Vaccine reactions can be classified into common, minor or non serious and rare serious reactions.

Non serious vaccine reactions:

These include common mild side-effects, such as local reactions (pain, swelling and/or redness), fever and systemic symptoms (e.g. vomiting, diarrhea, malaise), which can result as part of the normal immune response to the vaccine. Some of the non-antigenic vaccine components (e.g. adjuvant, stabilizers or preservatives) can also cause some of these reactions. The frequency and nature of common non serious vaccine reactions are outlined in table 2.2

Table 2.2: Frequency and nature of non serious vaccine reactions

Vaccine	Local reaction (pain, swelling, redness)	Fever (greater than 38 °C)	Irritability, malaise and non-specific symptoms
BCG	Common	- -	
Hepatitis B	Adults up to 30% Children up to 5%	1 – 6%	
Hib	Up to 25%	-	
Measles/MMR	Up to 10%	5-15%	Up to 5%(rash)
OPV	- Less than 1%	Less than 1% ^a	
Tetanus/DT/Td	Up to 10% ^b	Up to 10%	Up to 25%
Pertussis (DPT-Whole cell) ^c	Up to 50%	Up to 50%	Up to 60%
Management	<ul style="list-style-type: none">• Cold cloth at injection site• Paracetamol	<ul style="list-style-type: none">• Give extra fluids• Wear light clothing• Tepid sponge or bath• Paracetamol	<ul style="list-style-type: none">• Symptomatic

^a Diarrhea, headache and/or muscle pains

^b Rate of local reaction likely to increase with booster doses up to 50-85%

^c Acellular Pertussis vaccine causes lower rates of infection.

Occurrence of non serious AEFI with any change in nature, severity or frequency should be reported. While mild fever is a common reaction, high (39 – 40.4° C/ 102 – 104.8 °F) to extreme fevers (> 40.5 ° C/ 105° F) may indicate the possibility of sepsis or Toxic Shock Syndrome (TSS) resulting from a program error or a coexisting illness.

Serious vaccine reactions

Serious vaccine reactions are rare and may or may not have long term sequelae. For example serious reactions such as anaphylaxis though potentially fatal are treatable without leaving any long-term effects. An increase in the expected frequency of rare, serious reactions may indicate a problem with a specific batch of vaccine or a programme error. It is important to reiterate that not all AEFIs are actually caused by vaccines. Table 2.3 summarizes serious vaccine reactions, their time of onset and frequency.

Table 2.3: Frequency and nature of serious vaccine reactions,

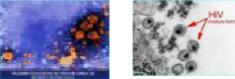
Vaccine	Reaction	Interval between vaccination and onset	Number of events per million doses
BCG	Suppurative adenitis	2-6 months	100-1000
	BCG Osteitis	Up to several years	-
	Disseminated BCG infection	1-12 months	-
Hib	None known	-	-
Hep B	Anaphylaxis	0-1 hour	1-2
Measles/MMR ^a	Febrile seizures	5-12 days	330
	Thrombocytopenia (low platelets)	60 days	30
	Anaphylaxis	0-1 hour	1
OPV	Vaccine-Associated Paralytic Poliomyelitis ^b	4-30 days	Up to 0.4 ^b
Tetanus	Brachial Neuritis	2-28 days	5-10
	Anaphylaxis	0-1 hour	1-6
	Sterile abscess	1-6 weeks	6-10
DPT	Persistent (>3hours) inconsolable screaming	0-48 hours	1,000-60,000
	Seizures	0-3 days	600 ^c
	Hypotonic Hypo Responsive Episode (HHE)	0-24 hours	30 - 990
	Anaphylaxis/Shock	0-1 hour	1 -6
Japanese Encephalitis	Serious allergic reaction	0 – 2 weeks	10 - 1000
	Neurological events	0 – 2 weeks	1 – 2.3

- ^a Reactions (except anaphylaxis) do not occur if already immune (~ 90% of those receiving a second dose); children over six years are unlikely to have febrile seizures
^b VAPP risk is higher for first dose (12 per 1.4 to 3.4 million doses) compared to 1 per 6.8 million for subsequent doses and 1 per 6.7 million doses for subsequent contacts.
^c Seizures are mostly febrile in origin, and the rate depends on past history, family history and age, with a much lower risk in infants under the age of 4 months

2.1.2 Programme Errors

Programme errors occur as a result of inappropriate transport, storage, handling, preparation and administration of vaccines. They must be immediately reported and investigated to ensure rapid response and corrective measures instituted quickly to prevent additional cases. A programme error often occurs when a vaccinator does not follow the standard immunization policies and practices. Table 2.4 outlines the most common programme errors leading to AEFI

Table 2.4: Common program errors leading to AEFIs

Program Errors	Possible AEFI
Non-sterile Injection	
 <ul style="list-style-type: none"> • Contact of needle with unsterile surface e.g. finger, swab, table etc. • Contaminated vaccine or diluent • Administering Injection over clothes • Improper handling of vaccine vials like touching of septum 	 <p>Infection e.g. local abscess at site of injection, sepsis</p>
 <ul style="list-style-type: none"> ▪ Use of reconstituted vaccines beyond the stipulated time (4 hrs for BCG and Measles, 2 Hrs for JE) ▪ Reuse of reconstituted vaccine at subsequent sessions 	<p>Toxic shock syndrome or death.</p>
 <ul style="list-style-type: none"> ▪ Reuse of disposable syringe & needle ▪ Improper storage and handling of syringes and needles leading to loss of sterility ▪ Syringes and needles used after expiry date 	 <p>Blood-borne infections e.g. Hep B, HIV, Hep C etc.,</p> <p>Abscess </p>
Reconstitution error/ Wrong vaccine preparation	
 <ul style="list-style-type: none"> ▪ Reconstitution with incorrect diluent ▪ Reuse of the reconstitution syringe ▪ Use of expired vaccine or diluents 	<p>Less vaccine effectiveness</p> <p>Toxic shock Syndrome</p> <p>Drug reaction; Death</p> <p>Sterile abscess</p>

Injection at incorrect site/route



- Injection into gluteal region (buttocks)



Sciatic nerve damage,
paralysis

- BCG/T series vaccine given subcutaneously

Local reaction or abscess

Vaccine transportation/storage incorrect



- Improper storage of vaccines like freezing of T-series vaccines and subsequent administration of frozen and thawed freeze-sensitive vaccine

Increased local reaction such as sterile abscess

Less Vaccine effectiveness

Contraindications Ignored

- DPT2 given after history of convulsions with DPT1

More severe convulsions

Programme errors may lead to cluster of events (2 or more cases) associated with a particular provider, health facility, single or multiple vials (e.g. freezing of T series vaccine during storage/ transport) of vaccine. Symptoms arising from a programme error such as local tenderness, tissue infiltration, vomiting, diarrhea, cyanosis and high temperature may help to identify the likely cause such as toxic shock syndrome.

Programme errors can be avoided by training health workers, proper supervision and supply of adequate equipment.

2.1.3 Coincidental Events

In general, coincidental events are clearly unrelated to the vaccination but still require investigation to confirm and classify the event (e.g. pneumonia after OPV). In general, if the same or similar event also affected others in the same age group around the same time, but they did not receive the suspect vaccine(s), then a coincidental event is more likely. There may also be clinical or laboratory evidence showing that the event is not related to immunization. However, certain serious events may be blamed on the vaccine by the parents or community because of the close temporal association with immunization,

especially if the vaccinated individual was previously healthy. Such cases need to be investigated, to allay public fear and maintain credibility and confidence in the immunization programme.

2.1.4 Injection Reaction

Some vaccinated children or adults may develop reactions such as fainting, light-headedness, dizziness, tingling aroundmouth and in hands and breath-holding (sometimes even leading to unconsciousness especially in younger children) in anticipation to or as a result of an injection of any kind. This reaction is unrelated to the content of the vaccine.

In group or outreach situations, overcrowding could increase the risk of injection reactions as well as programme errors. Mass hysteria is also possible, especially if a beneficiary is observed by others to faint or have some other reaction.

Where possible, care givers should be allowed to accompany the child being vaccinated to reassure the child and to feel reassured about the vaccination process. Overcrowding should be avoided by proper planning of the sessions. The vaccinator should provide parents and the community with clear explanations about the immunization in a calm and confident manner.

2.1.5 Unknown

The cause of the event cannot be determined. All efforts must be made to rule out all the above mentioned causes before reaching this conclusion.

2.2 Isolated and Clusters of AEFI

2.2.1 Isolated AEFI:

This is a solitary medical incident that takes place after immunization, causes concern and is believed to be caused by immunization

2.2.2 Cluster AEFI

A cluster is defined as two or more cases of the same or similar event, which is related in time, and has occurred within the same district or geographical unit, or associated with the same vaccine, same batch number administered or same vaccinator.

2.3 Reportable adverse events

It is essential to remember that the health staff should identify and report all serious and non serious adverse events. The system of reporting may vary from state to state. However as outlined in section 3.2, Non Serious AEFI should be reported “routinely” on a monthly basis and the serious AEFI should be reported immediately and also included in the monthly report and the linelist. The case definitions of some of the reportable AEFI are described in Table 2.5.

Table 2.5 Case definitions of some reportable adverse events.

AEFI	Case Definition	Vaccine
Vaccine associated paralytic poliomyelitis (presenting as AFP)	An acute flaccid paralysis 4–30 days following receipt of oral polio vaccine (OPV), or within 4–75 days after contact with a recipient of OPV, with neurological deficits remaining 60 days after onset, or death.	OPV
Anaphylactoid reaction (acute hypersensitivity reaction)	Exaggerated acute allergic reaction, occurring within 2 hours after immunization, characterized by one or more of the following: <ul style="list-style-type: none"> ▪ wheezing and shortness of breath due to bronchospasm ▪ laryngospasm/laryngeal edema ▪ One or more skin manifestations, e.g. hives, facial edema, or generalized edema. Do not report less severe allergic reactions	All
Anaphylaxis	Severe Immediate (within 1 hour) allergic reaction leading to circulatory failure with or without bronchospasm and/or laryngospasm/laryngeal edema.	All
Disseminated BCG infections	Widespread infection occurring within 1 to 12 months after BCG vaccination and confirmed by isolation of <i>Mycobacterium bovis</i> BCG strain. Usually in immuno-compromised individuals.	BCG
Encephalopathy	Acute onset of major illness characterized by any two of the following three conditions: <ul style="list-style-type: none"> ▪ Seizures ▪ severe alteration in level of consciousness lasting for one day or more ▪ Distinct change in behavior lasting one day or more Needs to occur within 48 hours of DPT vaccine or from 7 to 12 days after measles vaccine, to be related to immunization.	Measles, Pertussis

AEFI	Case Definition	Vaccine
Fever	The fever can be classified (based on temperature) such as <ul style="list-style-type: none"> ▪ Mild fever: 100.4 °F to 102 °F (38 to 38.9°C), ▪ High fever: 102 °F to 104.7°F (39 to 40.4°C) and ▪ Extreme fever: 104.7°F or higher (>40.5°C). 	All
Hypotonic, hypo responsive episode (HHE or shock-collapse)	Event of sudden onset occurring within 48 [usually less than 12] hours of vaccination and lasting from one minute to several hours, in children younger than 10 years of age. All of the following must be present: <ul style="list-style-type: none"> ▪ limpness (hypotonic) ▪ reduced responsiveness (hypo responsive) ▪ pallor or cyanosis – or failure to observe/ recall 	Mainly DPT, rarely others
Injection site abscess	Fluctuant or draining fluid filled lesion at the site of injection. Bacterial if evidence of infection (e.g. purulent, inflammatory signs, fever, culture), Sterile abscess if no evidence of bacterial infection on culture. Sterile abscesses are usually due to the inherent properties of the vaccine.	All injectable vaccines
Lymphadenitis (includes Suppurative lymphadenitis)	Either at least one lymph nodes enlarged to >1.5 cm in size (one adult finger width) or a draining sinus over a lymph node. Almost exclusively caused by BCG and then occurring within 2 to 6 months after receipt of BCG vaccine, on the same side as inoculation (mostly axillary).	BCG
Osteitis/ Osteomyelitis	Inflammation of the bone with isolation of Mycobacterium bovis BCG strain.	BCG
Persistent inconsolable screaming	Inconsolable continuous crying lasting 3 hours or longer accompanied by high pitched screaming.	DPT, Pertussis
Seizures	Occurrence of generalized convulsions that are not accompanied by focal neurological signs or symptoms. Febrile seizures: if temperature elevated >100.4 °F or 38 °C (rectal) Afebrile seizures: if temperature is normal	All, especially Pertussis, Measles
Sepsis	Acute onset of severe generalized illness due to bacterial infection and confirmed (if possible) by positive blood culture. Needs to be reported as possible indicator of Program error.	All injectable vaccines

AEFI	Case Definition	Vaccine
Severe local reaction	<p>Redness and/or swelling centered at the site of injection and one or more of the following:</p> <ul style="list-style-type: none"> ▪ Swelling beyond the nearest joint ▪ Pain, redness, and swelling of more than 3 days ▪ Requires hospitalization. <p>Local reactions of lesser intensity occur commonly and are trivial and do not need to be reported.</p>	All injectable vaccines
Toxic shock syndrome (TSS)	Abrupt onset of fever, vomiting and watery diarrhea within a few hours of immunization. Often leading to death within 24 to 48 hours. Report as a possible indicator of program error.	All injectable vaccines

Chapter 3

Recording and Reporting AEFI

Recording and Reporting AEFI

3.1 AEFI reporting System

The main service provider for childhood immunization in India is the government sector. However, utilization of private sector for childhood immunization is increasing.

Sessions in the government run centres are conducted on fixed immunization days at least once a week. The outreach sessions are conducted in a planned manner at regular interval on need basis. It is therefore important that all levels providing immunizations are sensitized to detect, investigate and report AEFIs. Therefore the responsibility of primary reporting of AEFI depends upon the places where vaccines are administered.

In Rural areas: The primary responsibility of AEFI reporting is with the Auxiliary Nurse Midwife (ANM) at each sub centre who provides immunization services to approximately 3000 to 5000 people. Also the medical officers of the Primary Health Centres (PHC) that provides health care to a population of 20,000 to 30,000 as well as the Community Health Centre (CHC) or Block PHC that targets a population of 80,000-120,000.

In Urban areas: AEFI reporting is primarily the responsibility of the health workers and the medical officers of the Corporations, Municipalities and Towns who provide immunization services through urban health facilities in underserved areas, maternal and child health centers and district hospitals.

It is also important that private practitioners both in rural and urban areas who administer vaccines report AEFI to the district health authorities.

AEFI

3.2 Channels of reporting AEFIs

There are two channels of reporting AEFIs

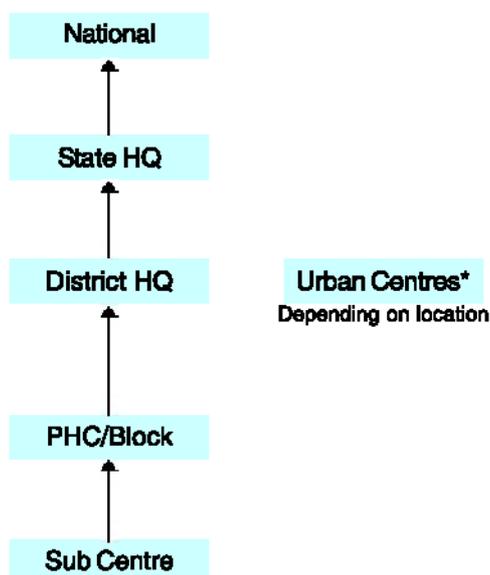
1. Monthly routine reporting
2. Immediate serious AEFI reporting

3.2.1 Monthly routine reporting

This includes reporting of all Non Serious and Serious AEFIs outlined in table 2.2 and table 2.3 from the level of Health worker (ANM) up to the National level (coordinated by the district) through monthly progress reports (fig 3.1) using existing immunization monthly progress reports / forms (vary from state to state) such as NRHM, HMIS, and RIMS etc. It is necessary for the ANM to submit “Nil” report in case no AEFI case detected from her area during the month This information is collated and compiled by health workers in monthly reporting formats under the heading of “Any untoward reactions or reportable AEFIs” and forwarded to the next level. They include,

1. Deaths
2. Injection site Abscesses
3. High Grade Fever (> 102° F)
4. Persistent inconsolable screaming (> 3 hours)
5. Seizure
6. Hypotonic Hypo responsive episode (HHE)
7. Other complications (including the cases not listed above such as severe local reaction, brachial neuritis, thrombocytopenia, lymphadenitis, disseminated BCG infection, osteitis/osteomyelitis and any untoward incident the vaccinator, ANM, Medical Officer think is a result of Immunization –both immediate and/or delayed.)

Figure 3.1 : AEFI Monthly Reporting - Data Flow



*Monthly reports to be sent to the respective district OR state HQ through the Asst. Health Officer (EPI)/Corporation Immunization Officer I/C

3.2.2 Immediate notification of Serious AEFI by the first person who identifies the event

All serious AEFI are to be immediately notified by the first person who identifies the event. This 'first' person should notify the case to the nearest government PHC, CHC and / or the District Immunization Officer¹ (DIO) / by quickest means of communication e.g. telephone, messenger etc. All persons involved in reporting AEFI should be aware of the timeline and channels of reporting. Notification should be followed up with a First Information Report (FIR – Annex 1).

It is important to initiate case management as a priority over AEFI reporting. The health authorities need to immediately respond to ALL reported AEFI.

Conditions warranting immediate notification and investigation

These are serious AEFI defined as “any untoward medical occurrence that results in death, hospitalization or prolongation of hospitalization, persistent or significant disability/incapacity, or is life threatening”. All serious AEFIs require systematic causality assessment. Additional AEFIs that need systematic causality assessment are:

- AEFIs that may be caused by a programme error, e.g., a cluster of bacterial abscesses;
- serious unexplained AEFI occurring within 30 days after vaccination and not listed in product label;
- events causing significant parental or community concern.

These are described in tables 2.3 and 2.5.

3.3 The process of reporting serious AEFI

These events are an emergency and need to be immediately investigated, managed and reported on standardized AEFI formats. Each serious event(s) should be followed up to determine the cause for its occurrence (causality assessment).

In India, the following reporting reports are used to guide AEFI investigation and causality assessment.

¹ In Urban areas, the DIO's counterpart would be the Medical Officer Health in charge of Immunization such as the Corporation Immunization Officer, Municipal Health Officer etc. The role and responsibility of the urban counterparts will be the same as the DIO for detection and responding to AEFI.

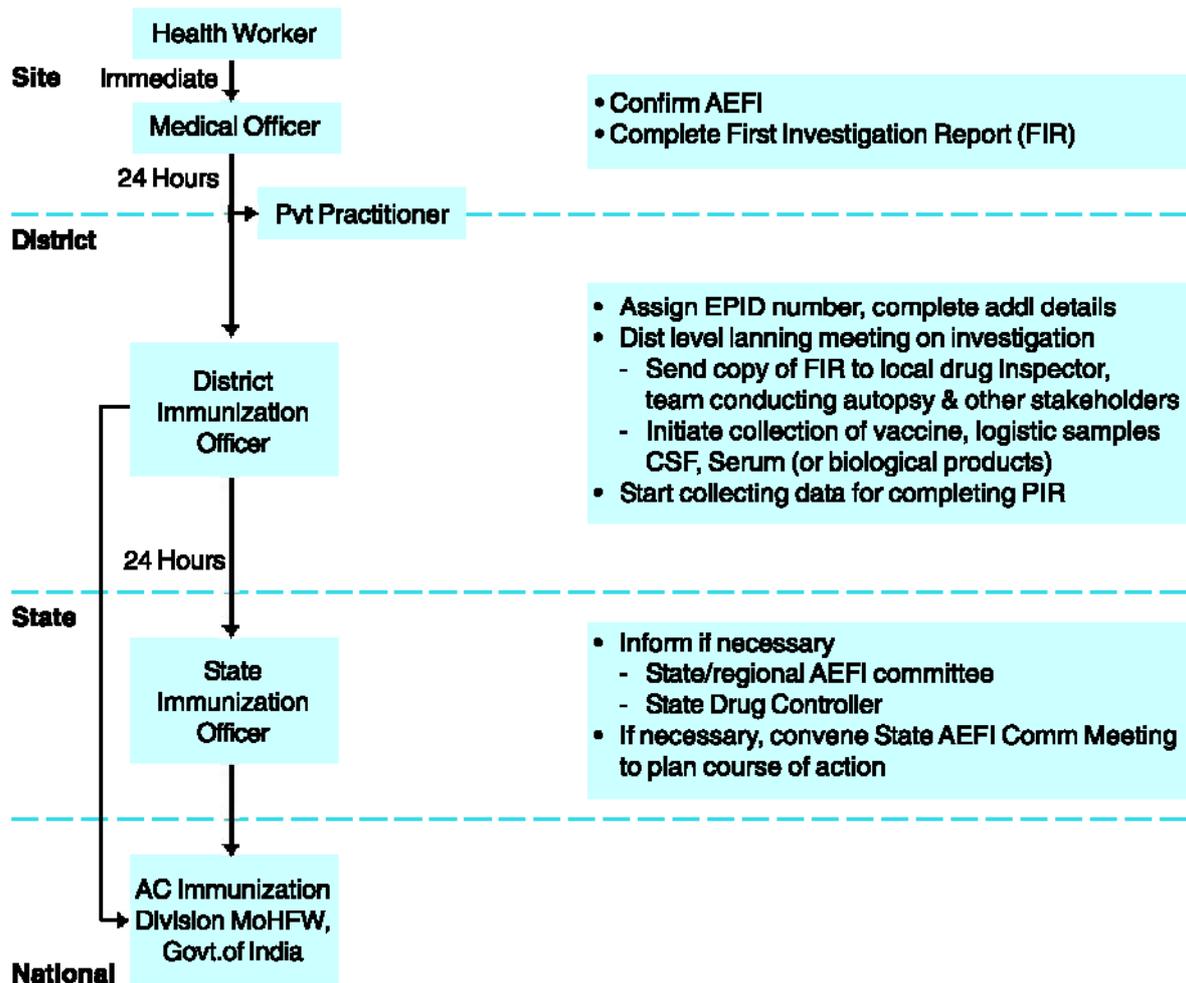
1. First Information Report (FIR)
2. Preliminary Investigation Report (PIR)
3. Detailed Investigation Report (DIR)

3.3.1 First Information Report (Annex 1)

Purpose: Provides the most basic information of the event to all levels and becomes the reference point for further investigations in a time bound manner

Routing and Reporting Timeline (Fig 3.2)

Figure 3.2 First Information Report – Routing, Timeline and Actions



1. The reporting can occur using the FIR form from any level in the government or private sector. The primary reporting (notification) will usually be done by completing “section A”, first information of the FIR form by any health worker including the ANM, AWW,

ASHA, ICDS, Health Supervisor, community mobiliser, private practitioner, RMP etc and submitting the same to the Medical Officer (the MO can also be the first person to report the case) of the nearest Government rural or urban Health Centre as soon as the event is brought to their notice.

2. The Medical officer should complete “section B”, first *investigation* of the FIR and submit the same to the DIO within 24 hours of notification of the event.
3. The DIO should complete the final details in “section C” in the FIR and submit to the State Immunization Officer and Assistant Commissioner of Immunization Division, MOHFW, Govt of India within next 24 hours.

Steps In completing FIR.

Role of health facility MO

- Ensure that the notified adverse event fulfills the criteria of a serious AEFI.

Medical officer (MO) should examine the patient and immediately submit the FIR (within 24 hours of notification) to the DIO.

Role of DIO

1. Within the next 24 hours, the DIO should review the FIR sent by the MO and provide district specific information like the EPID number, contact details, initiate sample collection and a tentative plan for further investigation and forward this copy to the State immunization officer and AC of Immunization Division, MoHFW, Government of India.

Specimens for testing must be collected as soon as possible as outlined in the chapter “AEFI - laboratory aspects”. The collected samples may be sent only if specified by the district AEFI committee.

2. DIO should convene a meeting of the district AEFI committee and determine the need for conducting a time bound investigation and deciding the further course of action.
3. The MO in consultation with the DIO should prepare a list of items relevant to that particular event that would assist the investigation team such as the relevant registers, ANM diaries, session tally sheets, indent records, used and unused vials, diluents and syringes .
4. The MO and DIO should ensure that such articles and items are kept secure, safe and are available at the time of preliminary and detailed investigation by the District AEFI team.

5. Copies of the FIR should be shared with

- District AEFI committee
- Drug Inspector (who is also a part of the AEFI committee)
- In case a post mortem (autopsy) is planned, a copy should be provided to the concerned officer
- The testing laboratory along with Laboratory Request Form (LRF) and other documents (as outlined in chapter 5 “Laboratory aspects of AEFI”), in case the district AEFI committee decides to send the samples of implicated vaccine/ diluents/ logistics or biological products for testing.

Role of State Immunization officer

1. On receipt of FIR at state level, the state immunization officer should decide on the gravity of the AEFI case and can take a decision to involve state/ regional AEFI committee at this stage or wait for the report of the PIR and involve the State/ Regional AEFI committee (including State drug controller) and chalk out further course of action.

Role of Assistant Commissioner AC of Immunization Division MoHFW, government of India

1. At the national level, the Assistant Commissioner of Immunization Division, MoHFW, government of India should decide on the gravity of the AEFI case and can take a decision to involve DCG(I) at this stage or wait for the report of the PIR and involve the DCG(I) (National AEFI Committee, if required) and chalk out further course of action.

3.3.2 Preliminary Investigation Report (Annex 2)

Purpose: The PIR will guide the investigating team to collect important information required for final categorization of the adverse event.

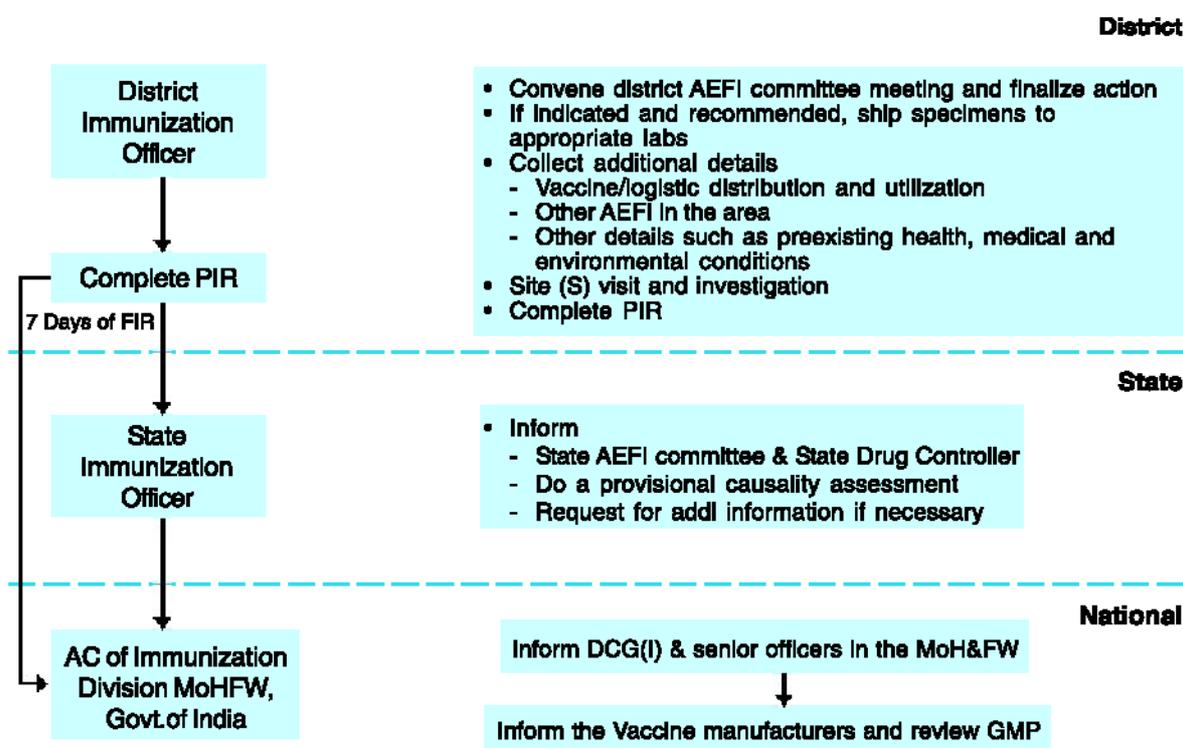
Routing and Reporting Timeline (Fig 3.3)

1. From DIO to the State immunization officer and AC (UIP) MOHFW, Govt of India as early as possible or within 7 days of submitting the FIR

Responsibility:

1. DIO assisted by the district AEFI committee and the area medical officer / staff.

Figure : 3.3 Preliminary Investigation Report – Routing, Timeline and Actions



Steps In completing PIR.

Role of the DIO

- DIO should discuss and coordinate with the district AEFI committee to plan the preliminary investigation using the PIR.
- He should first ensure that he has the relevant documents this includes
 - Complete FIR
 - Vaccine, cold chain, logistic distribution and utilization (including batch number, lot number etc)
 - Other AEFI in the area
 - Other details such as preexisting health, medical and environmental conditions both in the case(s) as well as the area
- Organize an AEFI investigation in the field as outlined in chapter 4
- Once the preliminary investigation is completed the district AEFI committee should review the findings and attempt to confirm the AEFI as per definition and categorize the type of the adverse event.

-
5. The completed PIR along with copies of supporting documents should be sent to the State Immunization Officer and Assistant Commissioner of Immunization Division, MoHFW, Government of India. Copies of the same should be shared with member of the district AEFI committee, the autopsy team (only in case of death) and laboratories to which implicated samples sent.

It is essential that the DIO should periodically update the State Immunization Officer on the status of the investigation and seek assistance if required

Role of State Immunization Officer

The state immunization officer will coordinate with the state AEFI committee which includes the state drug controller for review of the PIR and copies of the supporting documents, categorize the AEFI and decide the further course of action. Deaths and clusters should be taken up as a priority for review. The state AEFI committee should attempt to undertake a preliminary causality assessment for the event taking into consideration the state experience with the vaccine(s) and if necessary request for additional information such as laboratory tests, field level information etc.

Role of AC of Immunization Division MoHFW, Government of India

At the national level the Assistant Commissioner of Immunization Division, MoHFW, Government of India should share the available information in the PIR with the DCG (I) and other senior officers in the Ministry of Health and Family Welfare. The DCG (I) may inform the drug manufacturers and review Good Manufacturing Practices if required.

3.3.3 Detailed Investigation Report (Annex 3)

Purpose: The DIR is to guide the program managers at all levels to review the comprehensive data and information of the AEFI(s) to arrive at a possible cause for the occurrence (causality assessment) of this event.

The state/ regional AEFI committee will review and monitor quality of investigation and final assessment based on the investigation reports submitted by the district committees and arrive at a final conclusion on causality. State AEFI committee could request for assistance from the national AEFI committee if necessary.

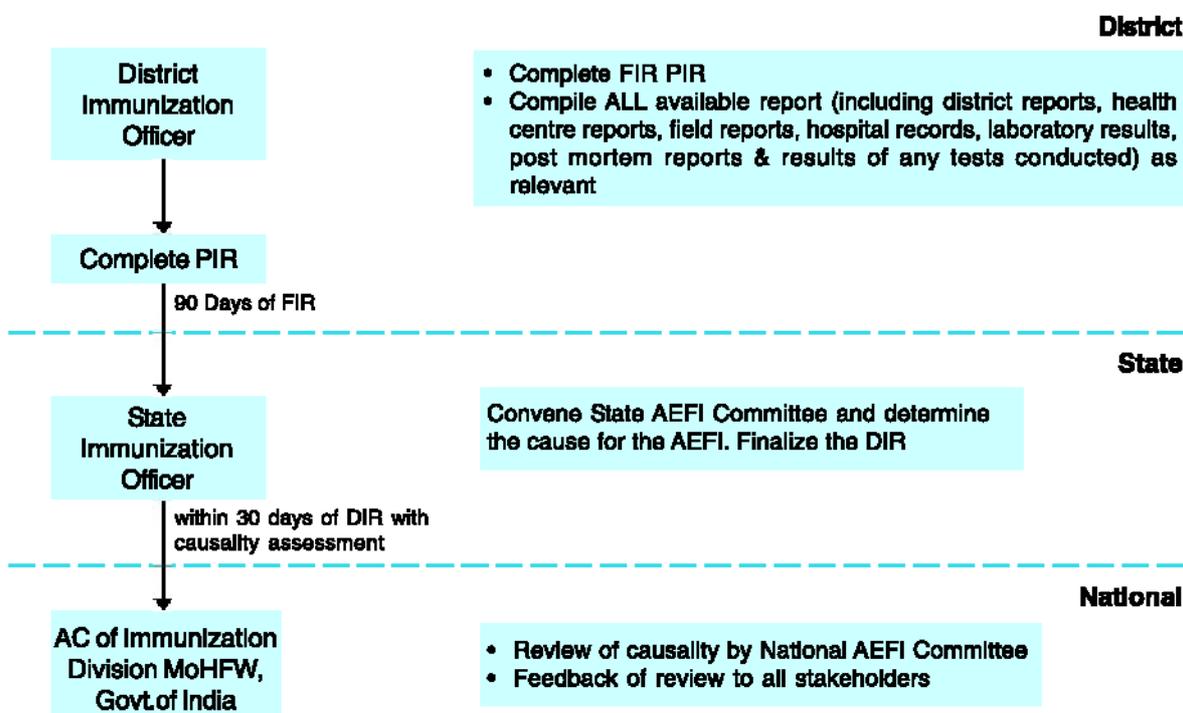
Routing and Reporting Timeline (Fig 3.4)

- Section A to be completed by the DIO with help of the district AEFI committee and forwarded with copies of supporting documents to State Immunization Officer not later than 90 days of submitting the FIR.
- This 90 day period has been provided to the district to ensure the processing of samples and collection of reports. *If the documents are available earlier the same should be sent with the completed DIR immediately.*
- The state immunization officer should convene a state AEFI committee meeting and conduct a causality assessment and complete the final documentation (section B) and forward the completed DIR with (causality) assessment and copies of documents to the AC of Immunization Division, MoHFW, Govt of India within 30 days of receipt of DIR at the state level.

Responsibility

- DIO
- State Immunization officer.

Figure 3.4 : Detailed Information Report – Routing, Timeline and Actions



Steps in completing DIR.

- The DIO should compile all the relevant documents including
 - Complete FIR and PIR
 - District reports, health centre reports, field reports, hospital records, laboratory results, post mortem reports and results of tests conducted and any other records as relevant
- The DIO should complete the DIR with assistance of the district AEFI committee, obtain the committee's endorsement and forward the same with a case summary report (as outlined in section 3.3.3) to the state immunization officer within 90 days of submitting the FIR.
- The state immunization officer should ensure that the final (causality) assessment is conducted by the state AEFI committee and results incorporated in the DIR within 30 days of receipt of the DIR at the state level. A copy of this along with the completed case summary should be sent to AC (Imm) as indicated above. The final report should include the diagnosis, type of adverse event and the key remarks/inputs of the district and state AEFI committee.
- Timely submission of completed DIR is a good indicator of AEFI surveillance.

 - ALL serious AEFIs should be reported in standard forms (FIR, PIR and DIR) through the fastest available means
 - For EVERY reported serious AEFI case, the district / state program officer has to ensure that all the 3 forms FIR, PIR, DIR and case summary are completed on time and submitted as outlined.

3.3.4 Maintenance of data and records

State level: In addition to a copy of the FIR, PIR and DIR of all the AEFIs reported, the State Immunization officer should maintain a database of all reported AEFIs in the form of a line list (Annex 5). A quarterly review of data of all serious AEFI should be done by the state AEFI committee. This will help the state to take appropriate action and improve AEFI surveillance. Feedback should be provided to all stakeholders.

National level: The National level AEFI database is maintained in MoHFW. It is regularly updated following receipt of FIR, PIR and DIR.

Periodic routine data analysis should be carried out at the district, state, and the national level. The monitoring of reported data includes the following information:

- Number of AEFIs reported
- Geographic and temporal distribution of AEFIs reported (look for clustering) and epidemiological analysis of the same
- Number and type of adverse events reported by antigen (e.g. Injection site abscess, seizures, HHE, etc.).
- Geographic distribution of possible programme related adverse events like abscesses
- Clustering of adverse events according to batch
- Timeliness and completeness of reporting
- Silent blocks/corporation/districts/states not reporting AEFI data

MoHFW has developed software (tool) for recording data of reported serious AEFIs. This generates basic (Time, Place and Person) analysis. All states need to maintain an AEFI database using this tool.

3.3.5 AEFI reporting by a private health facility / practitioner.

It is never appropriate to discontinue immunization while awaiting the completion of the AEFI investigation.

The district authorities (DIO/ CMO or the Block MO) should ensure that the key private health facilities and focal persons are identified and are sensitized about the AEFI reporting system for vaccines supplied by Government of India. Reporting of an AEFI from any private health facility or a practitioner should trigger an investigation by the district health authorities. Feedback of AEFI investigation and causality assessment should be provided. The reporting channels, documentation and timelines remain the same. Professional bodies like IAP, IMA, IPHA, Medical Colleges, Partner agencies like WHO/NPSP, UNICEF, PATH and others should also be involved in AEFI reporting.

It is never appropriate to discontinue immunization while awaiting the completion of the AEFI investigation.

3.4 Steps to encourage reporting

Staff should be encouraged to report AEFI without fear of penalty. Reporting can be enhanced by

- Training.
- Positive feedback.
- Ensuring there are enough support available at all levels
- Sharing results of the investigation and any corrective action taken.

Chapter 4

AEFI

Investigation

The ultimate goal of an AEFI investigation is to determine whether the reported event(s) was a result of the immunization process or the vaccine or to find another possible cause and correct it if possible, and reassure the public.

4.1 Objectives of investigating AEFI cases

- Confirm the reported diagnosis of an AEFI and clarify the details and outcome
- Record each incident that generates epidemiological data on safety of the antigen as well as injection safety practices
- Determine the contribution of operational aspects of the programme to the reported AEFI
- Determine whether a reported event was an isolated event or part of a cluster
- Determine whether unimmunized persons are experiencing the same medical event

4.2 Serious events that should trigger immediate investigation

The following trigger events should be investigated within 24 hours after notification to the medical officer

- AEFIs that are life threatening or those that result in hospitalization (or prolong hospitalization), disability (or have the potential to result in disability) or death.
- AEFIs that may have been caused by programme error and occur in cluster (e.g. bacterial abscess, severe local reaction, high fever or sepsis, BCG lymphadenitis, toxic shock syndrome).

AEFI

-
- Serious events of unexplained cause occurring within 30 days after a vaccination
 - Events causing significant parental or community concern.
 - Events in which vaccine quality is suspected

When an investigation is deemed necessary, it is important to initiate it urgently so that the cause may be determined (where possible) and, in some cases, additional cases prevented.

The reporting forms (FIR, PIR and DIR) will help and guide the periphery, district and state health authorities in collating relevant information that will help in final (causality) assessment of the adverse event. It is mandatory that the FIR, PIR and DIR (along with other relevant documents as described in section 3.3.3 Detailed Investigation Report) are fully completed for every notified serious AEFI case.

4.3 Steps in Investigating AEFIs

The following are the steps in an AEFI Investigation

1. Initial evaluation and First Information Reporting (FIR) by the health worker
2. Confirming the FIR and First Investigation
3. Decision on Preliminary Investigation by the District
4. Preliminary Investigation
5. Detailed Investigation, formulation of a probable hypothesis and action at local level
6. Causality assessment by the State AEFI committee and conclusion of the investigation
7. Submission of investigation report
8. Taking action

4.3.1 Initial evaluation and First Information Reporting (FIR) by the health worker

As soon as any serious trigger event as outlined above is recognized, the health worker should first attempt to treat the serious condition before starting the documentation process. The health worker should assure the parents or guardians that an investigation is being initiated to determine the cause for the same. The basic information about the event as well as the demographic details should be completed by health worker in section A the FIR form (Annex 1) and sent to the Medical Officer of the Health Center by the fastest

means possible. A private practitioner could report AEFI directly to the concerned medical officer of the nearest government institution or the district administration.

4.3.2 Confirming the FIR and First Investigation

On receiving information of an AEFI from the area either through an FIR from the health worker or through print or electronic media, the MO should begin an investigation immediately. He should verify the information and categorize and assess the AEFI using the case definitions (Table 2.5). He should collect data about the patient, vaccine, immunization services, details pertaining to vaccine batch and lot numbers used (in the session and in the center's stock) etc; complete the section B in the FIR and determine if the AEFI was serious enough to warrant further investigation by the district or justify the reasons for not considering the AEFI for further investigation. This FIR should reach the DIO within 24 hours of case notification to the MO.

4.3.3 Decision on Preliminary Investigation by the District

On receiving the FIR from the Medical officer, the DIO should first assign an Epid Number that should be able to capture information on the state, district, year of occurrence of the AEFI and the serial number. The outline for the code is IND (AEFI) - ST - DIS - YR – NUM. (similar to assigning epid numbers for AFP cases).

- IND (AEFI) indicates country code (India) and the condition (AEFI),
- ST indicates the state code (always two alphabets),
- DIS indicates the district code (always three alphabets),
- YR represents the year of event onset (e.g. 10 for 2010) and
- NUM denotes the serial number of the AEFI detected in the district in that year.

Therefore, IND (AEFI)-TN-CBE-10-001 will be the code of the first AEFI case (001) investigated in a Tamil Nadu (TN) in Coimbatore district (CBE) in 2010.

If the AEFI warrants further assessment, the DIO should complete section C of the FIR notify the state and the national program managers (as indicated in section 3.3.1) and initiate appropriate actions such as informing the district AEFI committee and initiating action for preliminary investigation. Copy of FIR should be sent to the local drug Inspector, team conducting autopsy & other stakeholders and only if appropriate, the implicated vaccine, logistic samples, CSF, Serum (or other biological products) should be collected and dispatched to appropriate laboratories with LRF.

If the case warrants no further investigation the details of the case should also be included in the monthly routine report and the FIR should be filed for records.

4.3.4 Preliminary Investigation

The DIO should spearhead the preliminary investigation. The DIO should collect background information such as the treatment taken by the case, the post-mortem details (if conducted) supported by the concerned MO. A district AEFI committee meeting (including the reporting MO) should then be convened to finalise the process of AEFI investigation.

Using the PIR form as a guide, the DIO supported by the MO and AEFI committee members should collect data about the patient, vaccine, immunization services etc. It would be helpful to obtain the patient's medical file (or clinical record), check details about the event from medical file and document information, obtain any additional details missing in the FIR and the PIR forms and identify any other cases that need to be included in the investigation. The completed PIR form should be sent to the State Immunization officer and the Asst Commissioner of Immunization Division Govt of India, immediately – not later than 7 days of submission of the FIR.

A brief summary of the details that should be collected for the PIR is outlined below

- **Patient**
 - Demographic data about patient, including epid number, age, sex, place of residence , family history;
 - History of present illness – symptoms and their chronology, treatment, outcome and diagnosis
 - History of patient's past illness e.g. reactions to previous vaccine doses, drug allergies etc
 - Pre-existing disorders, current medications
 - Immunization history – vaccine, number of doses received, date and place of last immunization, 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
 - Common environmental exposures

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- **Event**
 - History, clinical description, any relevant laboratory results about the AEFI and diagnosis of the event
 - Treatment and outcome
 - **Vaccines and diluents administered to patient**
 - Batch number(s)
 - Expiry dates(s)
 - Manufacturers(s)
 - Vaccine storage
 - Points from where vaccine was distributed
 - Whether other children were immunised with the same batch or same vial at same session and elsewhere
 - Laboratory test results about vaccine, if appropriate
 - **Immunization services**
 - Vaccine storage (including local vials), distribution and disposal
 - Diluent storage and distribution
 - Ice Lined Refrigerator (ILR)- what else is stored (note if similar containers are stored next to the vaccine vials which could be confused); which vaccines/ diluents stored with other drugs, whether any vials have lost their label
 - Immunization procedures: use of syringes, reconstitution(Process and time kept), drawing up vaccine, injection technique, safety of needles and syringes, disposal of opened vials
 - Evidence of vial contamination
 - Number of immunizations greater than “usual” as in catch-up round or usual session load more than the standard norm
 - Details of training in immunization practices for supervision and vaccinator(s)
 - **Background data**
 - Establish if cases have been reported from elsewhere and actively look for additional cases among other vaccinees and in the community

4.3.5 Detailed investigation, formulation of a probable hypothesis and action at local level

Within 3 months of onset of the AEFI, the DIO should compile all the relevant documents including complete FIR and PIR, district reports, health centre reports, field reports, hospital records, laboratory results, post mortem reports and results of any tests conducted (only if post mortem or laboratory tests were conducted).

A district AEFI committee meeting should be convened by the DIO where all the documents should be reviewed and an attempt made to establish a probable hypothesis. The following conditions could possibly be considered for the probable hypothesis.

- Vaccine Reaction
 - Known vaccine reaction
 - Vaccine manufacturer error
- Programme related
 - Vaccine transportation or storage error
 - Reconstitution error
 - Un-sterile practice
 - Incorrect administration technique
- Coincidental
- Injection Reaction
- Unknown

The DIO should send ALL the relevant documents pertaining to the AEFI case(s) (including the conclusions of the District AEFI committee) to the state program manager / state AEFI committee within 90 days of submission of the FIR.

Adverse events related to the vaccine

This type of event is caused by some component of the vaccine - the active component of the vaccine itself, the preservative, the stabilizer or other. Minor events settle without treatment and have no long-term consequences. The serious events are rare. It is very important to investigate each case where the vaccine quality is suspected.

If the event is suspected to be related to vaccine, check for the following:

- Is this a known reaction to the vaccine?
- Are similar events known to occur with other diseases?
- Is there a plausible (likely) mechanism for this event taking into account the biological properties of the vaccine?
- Did the event occur within a plausible (likely) time frame from the vaccine administration?
- Has the patient had similar symptoms in the past? Did these occur after vaccination or independently of vaccination?
- Was the patient on any concomitant or preceding drug therapy?
- Did the patient have any concomitant or preceding medical condition, which could explain the event?
- Were there any other factors that could explain the event e.g. programme errors
- How frequent is the occurrence for this event (common/rare/not previously reported)? Did the event occur within the expected frequency range?

Adverse event related to programme errors

Adverse event can be related to programme error when the events are caused by one or more of the errors outlined in table 4.1: (Page No. 40)

If program errors are suspected, the following should be checked

- Whether several cases occur and whether the same health worker administered the vaccines.
- Whether the unimmunized population in the same age group and the same geographical area presents the same symptoms.
- Whether the other people immunized with the same lot of vaccine in the same geographical area present the same symptoms.
- Whether the other people immunized with the same lot of vaccine in the same establishments on the same day do not present the same symptoms.

If any of the above are found, local corrective measures should be initiated immediately through logistics supply, training, and supervision.

Table 4.1 Adverse events related to programme errors

Related to vaccine, diluents & administration	Related to Needles & Syringes
Incorrect dosage of vaccine and/or diluent	Improper storage of the syringes and needles
Reconstitution of the vaccine with wrong diluents	Reuse of 5 ml reconstitution (diluents) syringe
Improper handling of vaccine vials like touching the septum.	Improper handling of the syringes and needles
Incorrect method of administration like injecting at wrong site or incorrect route.	Failure to verify the condition of the packaging that guarantees the sterility of needles and syringes
Substitution of vaccines or diluents with drugs or other substances	Syringes & needles used after their expiry date
Contamination of vaccines or diluents	Injecting through clothes
Inadequate shaking of T-series vaccines	
Use of reconstituted vaccine beyond stipulated hours	
Improper storage and use of the vaccines like freezing of T-series vaccines.	
Vaccines and diluents used after their expiration date	
Vaccines not discarded at the end of immunization session and used at a subsequent one	
Ignoring contradiction to vaccination e.g. child who had a severe reaction with a previous dose of DPT vaccine immunized with the same vaccine again.	

Coincidental adverse events

Some clinical cases simply coincide with the vaccination; that is, the event would have occurred even if the person had not received the vaccine. This could be demonstrated if the same event also occurred in a population group that was not vaccinated.

Even if the AEFI has not been linked to the vaccination, it may require adequate medical monitoring, and thus treatment /referral to higher center if needed should be done.

Adverse event where cause is inconclusive

When causality cannot be determined by the state AEFI committee, the reasons for same should be indicated to the concerned levels.

4.3.6 Causality assessment by the state AEFI committee and conclusion of the Investigation

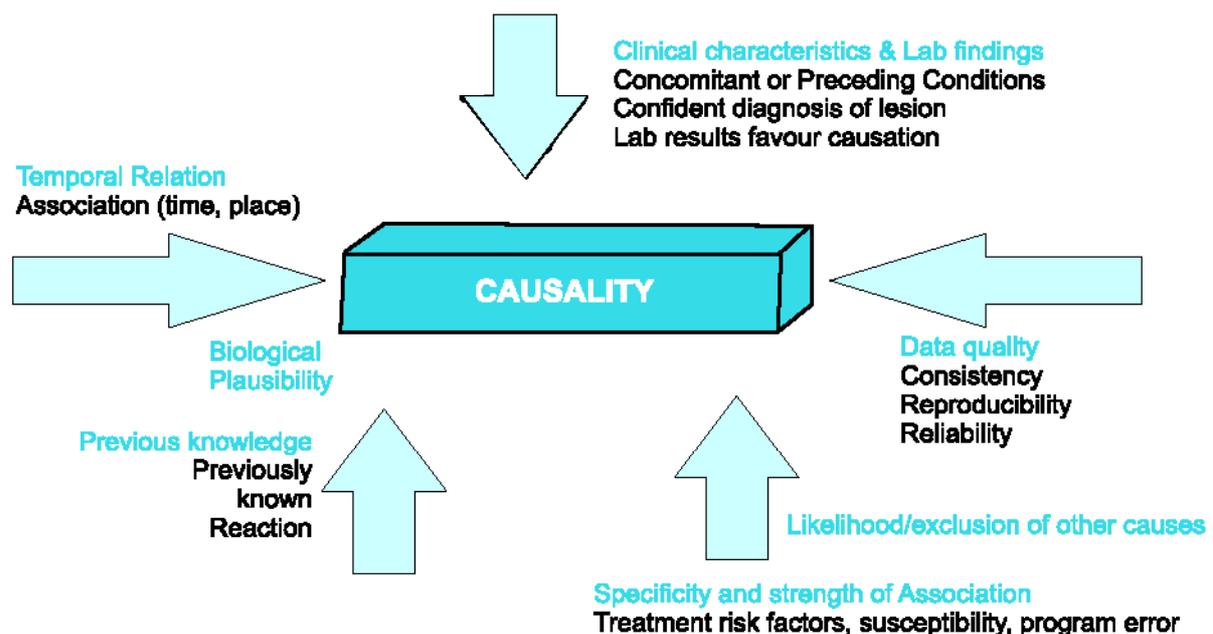
Causality assessment is the systematic review of data about an AEFI case to determine the likelihood of a causal association between the event and the vaccine(s) received. Causality assessment is to be done at State or National level. The quality of the causality assessment depends upon

- the quality of the AEFI case investigation and report and the effectiveness of the reporting system, and
- the quality of the causality review process.

There are many challenges involved with deciding whether an adverse event is actually caused by the vaccine. Vaccines are often administered to children at an age when many underlying diseases become evident. The fact that the vaccine was administered within a reasonable time period of that disease occurring does not automatically suggest that the vaccine caused or contributed to the disease.

Causality assessment will not prove or disprove an association between an event and the immunization. It is meant to assist in determining the level of certainty of such an association. It is not often that a definite causal association or lack of association is established for an individual event

Figure : 4.1 : Causality assessment of AEFI

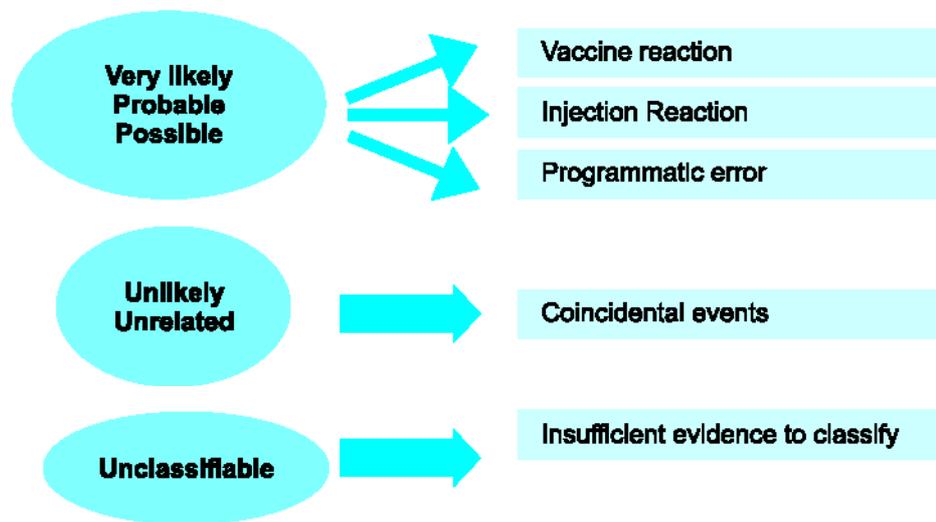


Poor quality causality assessment can lead to erroneous conclusions, crises and loss of confidence in the national immunization programme. Whether an AEFI is, or is not, attributable to the vaccine or the vaccination programme determines what, if any, steps need to be taken to address the event. Therefore the causality assessment of AEFI should be done only by the state AEFI committees (and NOT by the district AEFI committees) after very careful review of the following findings of the investigation

- Verify reason for reporting: diagnosis; whether serious or not
- Evaluate and assess factors.
 - ◆ Is this event known to be related to the vaccine? (**Consistency of findings, strength of association.**)
 - ◆ What is the frequency of occurrence of this adverse event? - Very common (>1/10); common (>1/100); uncommon (>1/1000); rare (>1/10 000); very rare (<1/10 000), or not previously reported.
 - ◆ Are similar events known to occur with other diseases? (**Specificity of association.**)
 - ◆ Is this event explainable by the biological properties of the vaccine? (**Biological plausibility.**)
 - ◆ Is the vaccination-to-event interval compatible with the event? (**Temporal relation.**)
 - ◆ Has the patient had similar symptoms in the past?
 - ◆ Is there a history of concomitant or preceding drug therapy?
 - ◆ Is there a history of a concomitant or preceding condition?
 - ◆ Are there other factors that could affect the occurrence of the event?
- Determine causality category using WHO criteria (Fig 4.2).
 - ◆ Is this an unknown event in relation to this vaccine?
 - ◆ Is this a new event?
 - ◆ Is there lack of sufficient data to reach a more definite conclusion?
 - ◆ Would the case benefit from a second review if more data became available?

Based upon answers to the questions above, in which WHO category does the case fit best?

Figure 4.2 : Categories of causality using WHO causality assessment criteria



- Provide expert opinion on the case summary report sent by the district on the final causality assessment criteria.
 - ◆ Take action on recommendation(s) from the review
 - ◆ Consider the case for education purposes.
 - ◆ Communicate findings to immunization programme staff, national, regulatory authority, and others (as appropriate).

As causality assessment is a critical part of AEFI monitoring the, state AEFI committee should be exceptionally cautious when arriving at one of the conclusions below.

- **Very likely/ Certain:** A clinical event with a plausible time relationship to vaccine administration and which cannot be explained by concurrent disease or other drugs or chemicals.
- **Probable:** A clinical event with a reasonable time relationship to vaccine administration; is unlikely to be attributed to concurrent disease or other drugs or chemicals.
- **Possible:** A clinical event with a reasonable time relationship to vaccine administration, but which could also be explained by concurrent disease or other drugs or chemicals.
- **Unlikely:** A clinical event whose time relationship to vaccine administration makes a causal connection improbable, but which could be plausibly explained by underlying disease or other drugs or chemicals.

-
- **Unrelated:** A clinical event with an incompatible time relationship and which could be explained by underlying disease or other drugs or chemicals.
 - **Unclassifiable:** A clinical event with insufficient information to permit assessment and identification of the cause.

4.3.7 Submission of Investigation report

The completed investigation reports (FIR, PIR and DIR) and other relevant records need to be submitted by the state to the Govt of India within 30 days of submission of the DIR by the district. Copies of all records must be accompanied with an AEFI case summary.

Case summary report

The case summary in the DIR is critical to conclude the causality. This summary report should include the findings of the investigation conducted by the district AEFI committee. Case summaries related to deaths following AEFI must be completed on priority basis.

General Instructions to be followed when writing summary report

- The case summary report is an event description report which provides historical record of AEFI and summarizes the findings and conclusions about a single serious AEFI or a cluster. It consists of a narrative describing and interpreting the event.
- A detailed write-up is necessary as the reports will be reviewed by expert panels at different levels (esp. at the State and National level)
- Death cases following AEFI must be given a priority.

Contents of the case summary report of the DIR:

1. General Information and details of Investigation:

- Name of the case, the place where event occurred, name of the PHC/Ward, district and state.
- When the first symptoms were observed, what they were and who reported the event?
- Who conducted the investigations and how long after the first symptoms were these started?
- How was the investigation conducted? (Was active search included; were relevant records checked and whether parents of children and other representatives of the community contacted? List should be attached)

-
- If any unimmunized child in the area had similar symptoms.
- 2. Clinical aspects for the affected child**
- Site of injection of each vaccine and time when given
 - Detailed clinical picture
 - History of previous doses
 - Outcome of illness
 - Diagnosis by treating physician and any relevant observation.
- 3. Operational Aspects**
- Batch no of involved vaccines
 - How is immunization sessions generally conducted in the area? Procedure followed on the day of the event (whether session was on the scheduled day)
 - When and from where the vaccines were received? How were the vaccines stored and transported. Batch number of the vaccines
 - How many syringes and needles were available and procedure followed for the sterilization of equipment
 - Was the vaccinator trained
 - Have similar reactions been observed in the past and were not reported
- 4. Laboratory investigation**
- The sample of vaccines and diluents sent to the CDL Kasauli for testing.
 - If sample of syringes and needles sent to CDL Kolkata
 - If any other tests were done on the patient or samples sent for testing
- 5. Autopsy**
- If a post-mortem was conducted relevant findings may be included.
- 6. Follow up:**
- State briefly the follow-up measures taken
- 7. Suggestions and recommendations:**
- Probable underlying cause of adverse event
 - What was the type of AEFI
 - Likely cause of adverse event

- Further steps that you would recommend to minimize the risks in the future:

4.3.8 Taking Action

The action following the investigation will depend on whether a cause for the adverse event was identified or not and if so what was the cause of the adverse event. Table 4.2 summarizes the actions that may be taken for different AEFIs.

Table 4.2 Summary of actions that may be taken for AEFIs

Vaccine reaction	<ul style="list-style-type: none"> • State AEFI committee along with State drug control authorities should immediately inform Govt of India, the National Regulatory Authority (DCGI) and the National AEFI Committee. • The Immunization Program division in consultation with the DCGI will then take a decision to temporarily suspend the use of the product - the type or lot of vaccine/syringe that is suspected with the approval of MoHFW. The NRA will convey this officially to the manufacturer. • Field samples of the vaccines / syringes etc. should be collected as per the established SOPs and forwarded for testing to the designated laboratories. (If warranted, the NRA may also re-evaluate the quality of the vaccine by conducting on-site GMP inspections etc.) • Based on the findings of vaccine testing, the following actions are recommended: <ul style="list-style-type: none"> - If the vaccine is implicated, the batch/ lot will be withdrawn - If the vaccine quality is satisfactory, the orders for temporary suspension will be withdrawn <p>Note: It is mandatory that the temporarily suspended vaccine be properly quarantined in adequate cold chain as per established SOPs of the State / Central regulatory authorities.</p>
Programme error	<p>Correcting the cause of the error. This may mean one or more of the following:</p> <ul style="list-style-type: none"> • Change In logistics for supplying vaccine. • Change in procedures at the health facility. • Training of field workers. • Intensified supervision <p>Note: Whatever action is taken, it is important to review at a later date to check that the programme errors have been corrected.</p>
Coincidental	<p>The main task is risk communication to ensure that the community is persuaded that the relation between the event and the vaccination is just coincidental. Although the AEFI is not linked to the vaccination, it may require medical management, thus a mechanism for referral to the necessary health services should be established.</p>
Unknown	<p>Depending on the nature of the event, its extent and whether it is ongoing, further technical assistance from an expert may be needed to assist an investigation or causality assessment. However, it must be accepted that in some cases the relationship to immunization is not clear. In addition to reporting the findings of the investigation to the concerned, the reason that no conclusion was drawn should be indicated, along with whatever progress was made.</p>

If the event(s) warrants urgent action

In such a situation State AEFI committee along with State drug control authorities should immediately inform Govt of India -NRA / National AEFI committee. The National/State regulatory and AEFI committees should coordinate and immediately take the following steps.

- Report the findings of the investigation to the State government & Govt of India.
- The details of the implicated vaccine or product should be submitted to Government of India immediately so that a decision could be made on the temporary suspension of its use and await further instruction from Govt of India
- NRA along with CDL and Immunization division will coordinate a re-evaluation of the quality of the vaccine and communicate to the manufacturer (by NRA), if necessary.

4.3.9 Challenges and pitfalls to causality assessment

- Causality assessment is not done, not systematic, or not done by trained personnel and/or not done in a timely fashion.
- Information in AEFI report is so limited that causality assessment cannot be done.
- Lack of expertise and/or independence of the review committee responsible for formal causality assessment undermines credibility.
- Non analysis of the AEFI in context after causality assessment may delay recognition of clusters and possible programme errors.
- Lack of skilled communication of findings, not addressing all target audiences, or lack of diplomacy and/or cultural sensitivity.

All of these can damage the credibility of the immunization programme by reducing confidence in vaccine safety.

4.4 Investigating an AEFI Cluster

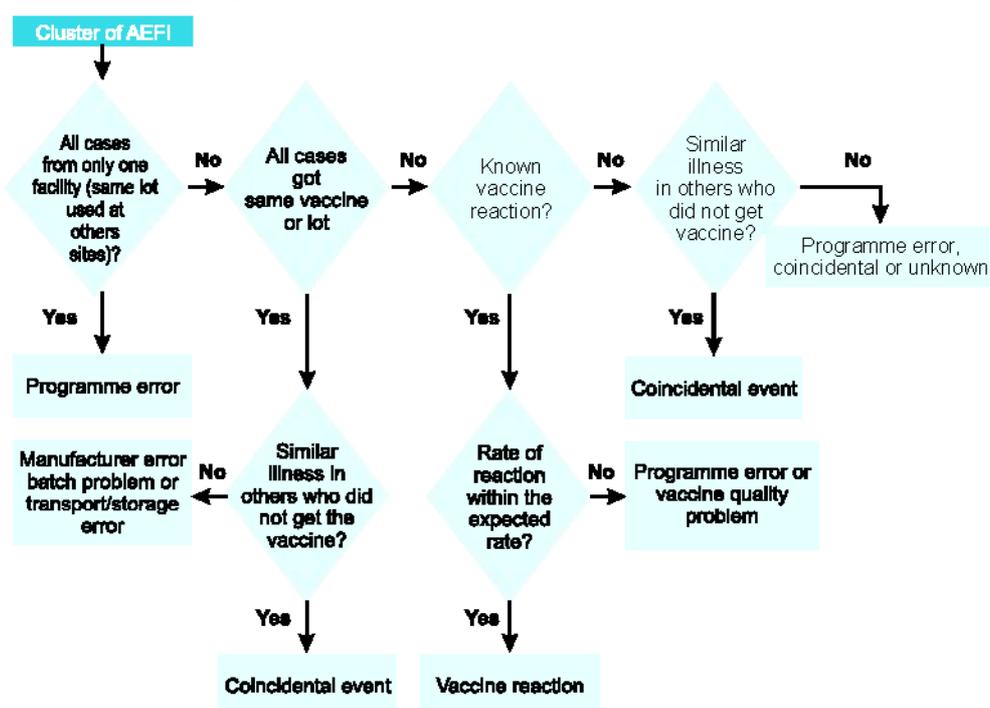
A cluster of AEFIs is defined as two or more cases of the same adverse event related in time, place or vaccine administered. The exact nature of the relationship between the adverse events (e.g., duration of “time”, proximity of “place”) will differ by the nature of the events and the circumstances within which they occur. A cluster may occur within the same district or geographical unit, or associated with the same vaccine, same batch number administered or same vaccinator.

Identifying cause in an AEFI cluster (Fig 4.3)

Even though the basic steps in investigation remain the same as described earlier, to identify the cause in an AEFI cluster, the following need to be checked

- A cluster of similar events is likely to arise out of program errors. If the event also occurred in unimmunized people, it may be coincidental. It is therefore important to identify if unimmunized people also developed similar symptoms around the same time.
- Identifying all persons in the area who have the illness that meets the case definition.
- Obtaining immunization history (when, where and which vaccines were given)
- If similar events are reported / seen in people from the same area in the same age group who were not immunized then the adverse event was probably coincidental.
- Identifying any common exposure among the cases.
- If all cases received vaccines from the same health worker/facility and there are no other cases, programme error is likely.
- If all cases received the same vaccine or lot/ batch number, and there are no similar cases in the community, a problem with the vaccine is likely.
- Finally, If the event is a known vaccine reaction but occurring at an increased rate, a programme error or a vaccine problem are likely causes

Figure 4.3 : Identifying cause in an AEFI cluster



A cluster of similar events is likely to arise out of program errors. If the event also occurred in unimmunized people, it may be coincidental. It is therefore important to identify if unimmunized people also developed similar symptoms around the same time.

Case studies (examples)

- In 2006 in a state A, four separate AEFI clusters of “collapse” occurred within five to 20 minutes following immunization with measles vaccine. All 14 cases presented with hypotonia; 11 became pale; seven cases had cyanosis, dyspnoea and increased saliva secretion; three patients had depressed respiration and 8 patient died; others recovered in less than one hour. In two of the sessions, vials that contained muscle relaxants were found stored with vials containing diluent, and of the same size and shape; labels on a number of vials recovered could not be read. Investigations revealed use of a muscle relaxant.

Cause: Use of muscle relaxant instead of diluent.

- In 1999 in state B, 21 infants died out of 70 infants supposedly given DPT vaccine. Insulin was stored in similar looking vials in the same refrigerator as DPT vaccine.

Cause: Use of insulin instead of DPT.

- In 2008 in state C, three infants died after administration of measles vaccine. Symptoms that developed within one and a half hour following immunization were fever, rash, vomiting, and diarrhea, and described by the attending health worker as “toxic shock syndrome”. Reconstituted vaccine was routinely kept until it was used, and as AD syringes were not available the vaccinator used the glass syringes which were never sterilized, but washed with ordinary water and wiped with cotton wool. No testing could be done.

Cause: Non-sterile Injection (contaminated reconstituted vaccine).

- In 2009 in State D, four children died and a fifth was hospitalized after receiving measles vaccine from the same vial. The infants died within minutes after receiving the vaccine. Before death the presenting signs and symptoms were high fever, frothing, vomiting, respiratory distress, cyanosis, rolling over of eyes and unconsciousness. The investigators found out the vaccinator had used some other drug instead of the diluent

Cause: Program error (error in reconstitution of vaccine).

- In 1997, country X used a new influenza virus vaccine for intranasal administration. To optimize both mucosal and systemic immune responses to the nasal vaccine, heat-labile Escherichia coli enterotoxin, was included in the formulation. However, after Bell's palsy was identified in some recipients of this intranasal vaccine, it was withdrawn from the market.

Cause: Vaccine reaction.

Chapter 5

Specimen collection and handling for AEFI

Specimen Collection and Handling for AEFI

Only the appropriate specimen in the correct quantity required for the investigation should be collected. Laboratory specimens should be accompanied by clear supporting documents (LRF, FIR, PIR and other relevant document), reasons for specimen collection and any specific additional request for information by the investigators.

Table 5.1 Activities and responsibilities for specimen collection following an AEFI

	Activity	Responsibility
1	Decision to collect sample (samples should be collected as soon as possible and sent only if the district AEFI committee decides)	<ul style="list-style-type: none"> District AEFI committee that includes local Drug Inspector. If required consult state AEFI committee
2	Decision to temporarily suspend the use of implicated batch of the vaccine/diluent/logistics	<ul style="list-style-type: none"> MoHFW Govt of India. The local drug authority representative after discussion with the AEFI committee.
3	Collection and sending of samples	<ul style="list-style-type: none"> Drug Inspector and DIO
4	Decision on type of samples that need to be collected	<ul style="list-style-type: none"> Based on recommendations of the District AEFI committee. The Drug Inspector may also collect additional samples as he considers appropriate.
5	Packaging & Cold Chain of samples	<ul style="list-style-type: none"> Drug Inspector and DIO
6	Sealing of specimen using "official lac seal"	<ul style="list-style-type: none"> Preferably by Drug Inspector; in case the drug Inspector seal not available, then by using the CMO's seal
7	Transportation of samples to laboratories	<ul style="list-style-type: none"> Preferably DIO and/ or Drug Inspector
8	Laboratory for sending specimen	<ul style="list-style-type: none"> Identified laboratories as described in this chapter

AEFI

	Activity	Responsibility
9	Funding	<ul style="list-style-type: none"> • The expenses for activities related to AEFI surveillance, AEFI case management, transportation of vaccine and other AEFI related activities can be made from the available funds under Part C (Immunization) of NRHM PIP (under the provision for 'State specific activities') after due approval by competent authority at block/district/ state level. • All expenses towards testing of vaccines in CDL Kasauli and Kolkata will be borne by the respective laboratories. • NIV Pune and NIV Gorakhpur will bear the expenses related to testing of samples for adverse events occurring following JE vaccination.
10	Reporting of laboratory results/ reports	<ul style="list-style-type: none"> • The laboratory as a rule will forward a copy of the report to CDSCO, AC Immunization Division, MoHFW, State Immunization officer, State Cold chain officer and State drug authority. • Laboratories will also send a copy of the laboratory results to all persons with contact details (complete address with pin code, phone and fax numbers and email address) mentioned in the LRF.
11	Feedback of Laboratory results	<ul style="list-style-type: none"> • DIO to share with <ul style="list-style-type: none"> - District cold chain officer, - Drug Inspector - Block Medical officer reporting the case - Private health facility reporting the case.

It is essential that testing is conducted for biological samples from the patients and if indicated, testing of vaccines, diluents and logistics are also performed. Laboratory testing of samples is not mandatory following AEFI, particularly if the cause is evident such as a coincidental event or a program error. However, laboratory testing is at times required to confirm or rule out the suspected cause. The laboratories where tests are performed are outlined below..

For biological samples,

- Histopathology, body fluids etc at laboratories identified and approved by the district/ state AEFI committees and
- Autopsy specimens at approved and accredited state forensic laboratories

As per the Central Drug Standard Control Organization (CDSCO) the following laboratories have the legal mandate for testing

- Vaccines and diluents for sterility and chemical composition at CDL Kasauli
- Syringes and needles for sterility at CDL Kolkata

5.1 Testing of Biological specimens

The district AEFI committee should identify Govt and reliable private laboratories for testing of biological products like blood, CSF, urine etc. However in case of adverse events occurring following JE vaccination, the CSF and blood samples should be sent to National Institute Virology in Pune or Gorakhpur after proper labeling and packing along with LRF and FIR. PIR and other relevant documents may be included if requested.

NIV Pune- Contact details

The Director, National Institute of Virology, (JE Group)
 Sus road Campus, Pashan, Pune 411021, Maharashtra.
 mail: nivicl@pn3.vsnl.net.in, acm1750@rediffmail.com
 Tel: 020-25880982, 020-26127301, 020-26006290 ;
 Fax: 020-25883595, 020-26122669, 020-26126399

5.1.1 Biological specimens from AEFI cases

It is difficult to generalize what specimens will be required in a given situation as it will depend on the symptoms and signs of the patient and the clinical decisions made by the doctor in charge of the case. Table 5.4 gives a general outline of some of the specimens that could be collected. The list is not exhaustive.

Table 5.4 Biological specimens to be collected for testing following AEFI

Event	Specimen from the patient
Severe Local Reaction Abscess Lymphadenitis	Swab , Blood
CNS Adverse events CNS Symptoms, No paralysis CNS Symptoms, with paralysis	Cerebrospinal fluid (CSF), blood Stool *
Other Anaphylaxis Toxic Shock Syndrome Death	Blood, Blood culture, Post mortem tissue specimen (as directed by physician) Urine

* If paralysis follows administration of OPV, stool specimens are important. These are to be collected as per the guidelines for stool collection in AFP case

5.1.2 Autopsy specimens in an AEFI case resulting in death

It is recommended that an autopsy in a death suspected to be due to an AEFI be performed as soon as possible (within 72 hours) to avoid tissue damage, development of post mortem artifacts and lysis of the adrenal glands, which can alter diagnosis.

The DIO should ensure that a detailed patient's history is included in the autopsy form that it is submitted to the team (autopsy surgeon/ pathologist/ forensic specialist) conducting autopsy.

The Additional specific information to the autopsy team will help them look for any underlying disease/pathologies in the deceased which may be cause of death or contributed in the cause of death.

Samples for both histo-pathological and toxicological examination should be sent to approved and accredited government reference laboratories through investigating police agencies. The samples should be collected and transported to forensic laboratories as early as possible to avoid loss of biological samples due to decomposition. All samples should be labeled with the name, Epid number, and autopsy report/ form along with documents requesting the examination and investigation, and the conclusions from the autopsy, which should list the cause of death, utilizing International Classification of Disease (ICD 10) and, if possible, the causative agents/drugs. The important aspects to be considered when conducting autopsies are outlined in Annex 10

5.2 Testing of vaccine/ diluents at CDL Kasauli

On the receipt of adequate samples with proper and complete documentation, CDL Kasauli tests vaccines and diluents for physical aspects, sterility, abnormal toxicity and biochemical identity. Tests for potency are not applicable in AEFI cases (it is related to efficacy rather than safety of vaccines). Laboratory tests are performed and results dispatched to the sender in approximately 30-45 days.

Laboratory testing for implicated vaccines/ diluents/ logistics should be requested only on a clear suspicion and not as routine, and never before the working hypothesis has been formulated.

5.2.1 Sample collection

The DIO and Drug Inspector should be involved in the collection of adequate quantity of implicated vaccine/ diluent samples from the site of occurrence of AEFI and last vaccine storage point and shipping the same in cold chain to the CDL Kasauli as early as possible.

- First collect each vaccine / diluent as described in table 5.2. Prepare four sealed sets with equal quantity and
 - Send one set to CDL Kasauli laboratory.
 - Retain one set at the site of collection (PHC/CHC or district HQ).
 - Retain two sets with the drug inspector.
- The desired quantity of vaccines or diluents must be collected from the next available vaccine storage point if the numbers outlined in table 5.2 are not available at the last vaccine storage point.
- It is important that the quantity required by the CDL Kasauli must not be compromised.

Table 5.2 Quantity of implicated vaccine / diluents to be collected

Vaccine	Quantity to be collected		Quantity to be shipped to CDL Kasauli for testing	
	unused vaccine vials / ampoule	unused diluent vials/ ampoule	unused vaccine vials/ ampoules (one fourth of total samples collected)	unused diluent vials/ ampoule (one fourth of total samples collected)
	(A)	(B)	(C)	(D)
DPT group of vaccines (including Pentavalent)	10 dose X 40 vials OR 01 dose X 120 vials	NA NA	10 dose X 10 vials OR 01 dose X 30 vials	NA NA
BCG Vaccine	10 dose X 160 vials 20 dose X 160 vials	160 diluents 160 diluents	10 dose X 40 vials 20 dose X 40 vials	40 diluents 40 diluents
Oral Polio Vaccines	20 dose X 40 vials	NA	20 dose X 10 vials	NA
Measles/MMR Group	01 dose X 80 vials OR 05 dose X 60 vials OR 10 dose X 40 vials	80 diluents 60 diluents 40 diluents	01 dose X 20 vials OR 05 dose X 15 vials OR 10 dose X 10 vials	20 diluents 15 diluents 10 diluents
JE & Hepatitis vaccines	01 dose X 120 vials OR 05 dose X 60 vials OR 10 dose X 40 vials	120 diluents 60 diluents 40 diluents	01 dose X 30 vials OR 05 dose X 15 vials OR 10 dose X 10 vials	30 diluents 15 diluents 10 diluents

5.2.2 Packing of samples

- Separate plastic zipper bags should be used for packing different vaccine and diluents.
- The name, age, date of collection, AEFI epid number and point of collection of vaccines/ diluents should be mentioned only on the label of each plastic zipper bag.
- All the packed zipper bags (separate for vaccines and diluents) should then be put in a bigger zipper bag.
- The big zipper bag should be placed in a card board box, tied with a string from all sides and an “official lac seal” affixed by the drug inspector (fig 5.1 and 5.2). The CMO’s “official lac seal” may be used if the “official” lac seal of the drug inspector/ is unavailable.

Figure 5.1



Figure 5.2



5.2.3 Documentation and transportation of sample to laboratory

- The completed LRF (Annex 4) also sealed with the same “official lac seal” should accompany the samples sent to the laboratory. The “official lac seal” ensures that the samples and details sent to laboratory are not tempered / changed during transportation.
- Ensure that the completed investigation forms (FIR, PIR) also accompany the samples to the laboratory.
- Vaccines and diluents are tested simultaneously, therefore freeze dried vaccines (BCG, Measles, and JE) should be accompanied by their respective diluents.
- The sample should be transported to the laboratory under cold chain (vaccine carrier with ice packs or thermocol boxes with icepacks) preferably through a messenger.

-
- CDL laboratory Kasauli accepts samples received on all days of the week. The messenger carrying the samples to CDL Kasauli must insist on getting the 'sample received receipt' for official record. This receipt will also provide details on the condition of samples received in the laboratory. (issue of receipt will not be possible in cases when the samples are received on weekends).
 - Samples may also be sent by courier that has experience in handling biological products and can also **guarantee** delivery up to CDL Kasauli within the stipulated time under the stipulated conditions.

Address for shipment of vaccines and diluents

Head, Central Drugs Laboratory, Central Research Institute, Kasauli – 173 204, Himachal Pradesh.

Email : nclkasauli@bsnl.in ; Phone: 0179-2272046, 2272060 Fax: 0179-2272049, 2272016

Example of vaccine / diluent collection

An AEFI occurred in district M following use of a 5 dose vial of Measles vaccine at a session site. The District AEFI committee reviewed the case and decided to collect the implicated batch of measles vaccine and diluent for testing in CDL Kasauli.

As per guidelines (Table 5.2) the team comprising DIO and Drug inspector planned to collect 60 vials of Measles vaccine and 60 ampoules of measles diluent.

However, during the site visit, they were able to find only one partial and one unused vaccine vial of the same batch with the ANM. They therefore collected 59 unused measles vials from the PHC vaccine storage point. The total quantity required (i.e. 60 vials) was thus complete. The vaccine vials were then packed in different zipper bags and labeled mentioning the point from where they were collected; in this case it was session site and PHC.

The next step was to collect 60 measles diluents; they could only collect 45 diluents of the implicated batch from PHC and another 15 diluents from the district vaccine store. The total quantity required (i.e. 60 diluents) was now complete. The sample was packed in zipper bag and labeled accordingly.

The zipped and labeled bunches of 15 vaccines and 15 diluents were placed in cardboard cartons and sealed with the Drug Inspector's "official lac seal" and 4 sets were made

They sent one set containing 15 vaccine vials (unused) and 15 diluents (unused) under cold chain for testing to CDL Kasauli (Table 5.2) along with a LRF, FIR and PIR.

The rest of the sets was packed and retained at different levels as per guidelines mentioned above.

Tests done on opened used / partially used vials at CDL Kasauli

Used (opened) vials are technically not required by the CDL Kasauli for testing, the sender is however encouraged to send the used vial (if available) to ensure that the same batch of the unused vials are being sent for testing.

The opened vials are **usually not tested** because of following reasons:

- Quantity of vaccine is often inadequate for testing
 - Once the vials are opened they become unsterile because of contamination from the surrounding environment.
 - Reconstituted vials cannot be tested beyond 4 hours.
 - Opened vials have weak legal sanctity.
-

5.2.4 Dos and Don'ts for collection of vaccine/ diluent samples and transportation

Dos

1. Collect unused samples only from the implicated (suspected) batch.
2. Send the implicated samples of vaccine and diluent to the laboratory affixed with "official lac seal".
3. Ensure that the accompanying LRF is also affixed with the "official lac seal".
4. Pack the diluents carefully and separately in a sealed packet.
5. Mention the point from where the vaccines/ diluents were collected on the label of each plastic zipper bag.
6. Ensure the name of the vaccine, batch number, manufacturing and expiry dates and other details on the label as affixed by manufacturer are intact and clearly visible on all the vials/ ampoules of the samples.
7. The packing should be such that there is no breakage of vials. The small cartons in which the vaccines are supplied by the manufacturers may be used for this purpose. The vaccines should be packed in a plastic zipper bag and sealed. The pack is then put in the vaccine carrier or thermocol box with ice packs. (Dry ice may be used for OPV samples and NEVER for freeze sensitive vaccines)
8. The address of the CDL Kasauli should clearly be written on the box.
9. The samples should be accompanied with the LRF and FIR. PIR and other relevant records if available may be sent.

Don'ts

1. Labels must NEVER be wrapped with adhesive tape or any other labels on the vaccine/ diluent vials as shown in fig 5.3 and 5.4 below
2. There should be no wetting of labels or mutilation. Appropriate labels may be affixed on the zipper bags with vaccine samples inside.
3. The vaccines should not have expired at the time of receipt of vaccine in the laboratory.

Figure 5.3



Figure 5.4



5.3 Testing of syringes, needles and vitamin A samples at CDL Kolkata

CDL Kolkata is the identified laboratory where implicated sample of AD Syringes/ Reconstitution Syringes and Vitamin A etc are tested for standard sterility and physical parameters. The testing of the AD syringes/ reconstitution syringes/ and vitamin A should be initiated following decision by the District / State AEFI committee and/or when there is clear basis of suspicion and NOT as a routine procedure. Laboratory tests are performed and results dispatched to the sender approximately in 60 days of receipt of the samples

5.3.1 Sample collection

A representative of the local Drug Authority (Drug Inspector) should be involved in the collection of Samples (Vaccine) as per Drugs and Cosmetics Rules and transfer of sealed samples to the CDL Kolkata. The sample of implicated AD Syringes, Reconstitution Syringes or Vitamin A that are sent should be of the same manufacture and batch number. The samples should be collected in 4 equal sets; one set has to be sent for testing; one set retained at the point of collection and two sets retained with the drug inspector/ (table 5.3). The samples can be sent through reliable courier or postal services. Cold chain is NOT required.

Table 5.3 Quantity of unused syringes/ needles and Vit A to be collected for testing

Sample	Unused quantity of Implicated batch
AD Syringes	4 Sets of 50 pieces each (total 200) <ul style="list-style-type: none">• 50 pieces to be sent to CDL Kolkata• 50 pieces to be retained at the source of collection• 2 sets of 50 pieces each (total 100) to be retained by Drug Inspector(local Drug Authority)
Reconstitution Syringes	4 sets of 50 pieces each (total 200) <ul style="list-style-type: none">• 50 pieces to be sent to CDL Kolkata• 50 pieces to be retained at the source of collection• 2 sets of 50 pieces each (total 100) to be retained by Drug Inspector(local Drug Authority)
Vitamin A	4 sets of two 100ml bottles (total 8 bottles) <ul style="list-style-type: none">• 2 bottles for CDL Kolkata• 2 bottles to be retained at the source of collection• 4 bottles to be retained by drug inspector/ (local Drug Authority)

5.3.2 Packing, documentation and shipment

- The used samples (AD syringes/ Reconstitution/ Disposable/ Vit A) if available should be sent along with the unused batch of the same manufacturer. Both items should be sealed in separate packets, labeled with the site of collection, placed in a card board box, tied with a string from all sides and an “official lac seal” affixed by the drug inspector/. The CMO’s “official lac seal” may be used if the “official” lac seal of the drug inspector is unavailable.

Address for shipment of syringes, needles and vitamin A

The Director, Central Drug Laboratory, Min. of Health & Family Welfare, Govt. of India,
3, Kyd Street, Kolkata- 700016.

Email: cdlkol@gmail.com Phone: 033- 22298541, Fax: 033-222 99380, 033- 222 98336.

- The samples should be sent with completed LRF form and FIR. PIR and other relevant may be sent if requested.
- In case Vitamin A is being sent for testing, the used bottle if available can also be sent along with the unused sealed bottles of Vitamin A with quality packing to avoid breakage or spillage during transportation.

Important considerations

- Health authorities need to coordinate with the police / other investigating departments and acquaint them with the National AEFI guidelines.
- All original documents must be retained by the medical officer in charge. Documents requested by the police/ other investigating agencies should be shared as attested copies.

Chapter 6

Operational aspects of AEFI Surveillance

Operational aspects of AEFI Surveillance

An effective immunization safety surveillance system must be able to detect and differentiate the types of AEFI in order to prevent their occurrence and/ or reduce their impact. The surveillance of Adverse Events Following Immunization in India was first initiated in 1986.

6.1 The goals of AEFI surveillance

- Minimize the negative impact of AEFI on public health
- Monitor the quality of vaccine used for immunization
- Ensure and monitor the quality of immunization services
- Reduce morbidity and mortality due to AEFIs

The Central Drug Standard Control Organization (CDSCO) and the Universal Immunization Programme (UIP) coordinate the implementation of the AEFI surveillance system. The National, State and district AEFI committees, Central Drugs Laboratory (Kasauli and Kolkata), National and Sub-national drug authorities and State forensic laboratories play a pivotal role.

6.2 The objectives of AEFI surveillance

- Detect , report, and respond to AEFIs timely and promptly
- Identify unusual high rates of AEFI with any specific vaccine lots/ brands
- Promptly address programmatic errors through implementation of corrective measures
- Maintain confidence of the community and health workers in the immunization programme by properly and promptly responding to their concerns

AEFI

-
- Estimate serious AEFI rates in the population as compared with local and global data.
 - Identify signals for unexpected Adverse Event and generate new hypotheses about these events that must be confirmed by planned studies and laboratory investigations.

6.3 Key elements of the AEFI surveillance system

- Rapid notification and evaluation of AEFI information followed by effective response
 - Adequate education and training of the key personnel,
 - Well defined standard operating procedures to ensure clarity, uniformity and avoid duplication of efforts
 - An AEFI database for comprehensive analysis at appropriate levels
-
- Timely investigation and completeness of reporting are the critical indicators of a functioning AEFI system in the district/ corporation.
 - Zero or no reporting of any non serious AEFI case in the district or a block or a ward indicates poor sensitivity.
-

6.4 Roles and Responsibilities of Key Players:

The AEFI surveillance system involves a network of key players listed below

1. Sub centre level
 - a. ANM,
 - b. Anganwadi & ASHA
 - c. Health Supervisors
2. Private sector
3. PHC/ CHC/Corporation/Ward/ Urban level: Medical Officer
4. District level: CMO / DIO
5. State Level: Director FW / State Immunization Officer
6. National Level: Assistant Commissioner of Immunization Division, MOHFW

Their roles are outlined below.

6.4.1 Sub centre Level

ANM

- Follow best injection practices including recording the particulars of the vaccine and diluents before beginning of the RI session (e.g. manufacturer name, manufacturing and expiry date, batch number),
- Provide a list of children vaccinated in session with the AWW/ASHA and request them to be alert, follow up and report AEFIs (if any) to the concerned MO.
- Treat mild symptoms like fever, pain and refer other cases to MO (PHC) or to appropriate level of care
- Provide immediate first aid and refer AEFI to MO (PHC) or to appropriate health facility for prompt treatment and report serious events/cluster of events immediately in section A of the FIR form to the MO (PHC)/DIO.
- Report AEFI details in the monthly progress report. A NIL report should be submitted in case no AEFI is observed. Detailed notes on reported AEFIs should be available with the ANM.
- Assist in investigation of AEFIs and take corrective action in response to the guidance from the MO(PHC).

Anganwadi & ASHA

- Post vaccination - follow up with beneficiaries to identify AEFIs.
- Inform the adverse event immediately by telephone concerned ANM, MO etc
- Assist in referral of cases
- Assist the team investigating the event
- Support in building community confidence

Health Supervisors (HS)

- To supervise and provide hands on training to the ANMs / vaccinators in the field.
- Monitor the community for adverse events during their supervisory visits to immunization sites or sub centres. Also monitor and ensure follow-up of beneficiaries by health workers.
- Encourage the Health Workers to report AEFIs.
- Analyze the reported AEFIs in the sub-centre monthly reports and keep track of Health Workers who have not reported any AEFI over a period of time.

-
- Assist the investigation team in conducting the investigation.

6.4.2 Block PHC/ CHC/Corporation/Ward/ Urban Health post

Medical Officer In charge

Detection of AEFIs

- Train staff in detecting, managing and reporting of AEFIs and differentiating between non serious and serious events. Encourage the staff to report AEFIs.
- During investigation, enquire about any recent outbreak of disease / illness or any death in the community which may or may not have been related to vaccination.

Management of AEFIs

- Clinical case management of AEFI and referral to next level if required.
- Ensure availability of emergency drugs and medical equipment to deal with an adverse event. Regularly check the emergency kits (functional status of equipment and expiry of drugs)

Reporting of AEFIs

- Ensure reporting of AEFIs from sub-centre to PHC to District/Corporation. Ascertain that NIL report from ANM gets submitted only after an effort to look for these events in the children recently vaccinated.
- Detailed notes of all reported (non serious and serious) AEFIs by Health Workers should be recorded in an AEFI register.
- Conduct timely investigations when cases are notified, completely fill up the section B of FIR and should justify if he disagrees with information in Section A and submit the same to the DIO.
- Maintain quality (e.g. good clinical history, pre and post vaccination health status, community investigation etc) during investigation and documentation (when completing the FIR, PIR and DIR).
- Ensure adequate supervision and monitoring in the field.
- Communicate and share the results of investigation with health workers and the community wherever warranted.

6.4.3 Role of the private sector

The private sector in India plays an important role in providing of immunization services.

- In rural areas, sometimes they improve access to basic vaccines fill gaps in service delivery and are more flexible with timings and approachability.
- In urban and wealthy localities, the private sector functions as a provider of new and underutilized vaccines, quickly adopt new vaccines and technologies before adoption by the public sector.

Thus AEFI detection management and reporting by the private sector is important to ensure timely and complete information about both conventional vaccines as well as new vaccines and technologies. The private practitioner is encouraged to report AEFI to the nearest government health care facility or the district immunization officer. The FIR form could be used for notification of cases (Fig 3.2).

6.4.4 District Level

CMO / DIO

Pre event

- Establish a functional district/corporation (or local bodies) AEFI committee with defined Terms of Reference and responsibilities.
- Ensure adequate documentation of AEFI system is maintained and available at the District level. This should include contact list of AEFI committee officials at various levels, terms of reference of the AEFI committee, line listing of serious AEFI cases, completed reporting formats (FIR/PIR/DIR) and their supporting documents, spot maps and other AEFI related communications such as letters, government orders(GOs), bulletins, State AEFI committee meeting minutes, feedback , vaccine sample results etc.
- Establish sentinel surveillance for AEFIs, coordinate and lead activities related to AEFI detection, management and reporting in coordination with District AEFI committees.
- Ensure that personal contact details are shared with appropriate staff in Government, autonomous bodies and private institutions undertaking vaccinations.
- Ensure availability of adequate reporting forms (monthly reporting forms and FIR) and logistics to prevent AEFIs due to program errors

-
- **Ensure AEFI guidelines are disseminated and staff trained and sensitized to detect and respond to adverse events on time.**
 - **If possible, identify nodal persons in institutions for reporting adverse events. These can be the same persons who are presently supporting AFP and VPD surveillance.**
 - **Review data, analyze AEFIs reported through HMIS/RIMS and other reporting channels in the district discuss AEFI surveillance as part of the monthly MO meeting and share feedback with State and block PHC / CHC in district.**

Event

- **Investigate all serious AEFIs immediately. Confirm the event reported by the MO, complete the FIR and recommend detailed investigation as indicated in chapter 3 “Reporting AEFI”. Coordinate with the district AEFI committee and initiate the process of First Investigation and submit the details to the state and national levels within 24 hours of notification.**
- **Ensure timely management of cases in district including coordination with local hospitals /laboratories from govt. sector, medical colleges and other private hospitals to deal with any referral/ testing or other procedures following AEFI.**

Post event

- **Complete the preliminary and detailed investigation as per the stipulated timeline and coordinate with the district AEFI committee to complete the documentation and submission of the details to the state and national levels**
- **Coordinate with laboratories undertaking sample testing and share the conclusions and results of investigation with appropriate levels.**
- **Within a district, a corporation should be considered as a separate entity for AEFI reporting and investigation. It should have its own independent AEFI committee. For AEFI surveillance the Corporation Medical Officer (in charge of immunization) should be considered as equivalent to a DIO in a district. After investigation, the Corporation MO should send the details of investigation to the state for final causality assessment.**

6.4.5 State Level

Director FW / State Immunization Officer and drug authorities

Pre event

- Coordinate and lead the AEFI activities in the state as the nodal person.
- Establish a functional state AEFI committee (including state Drug Authority) with defined Terms of Reference and responsibilities.
- Maintain AEFI related documentation at the State level. Available documentation should include contact list of AEFI committees, the terms of reference of the AEFI committee, line listing of serious AEFI cases, completed reporting formats (FIR/PIR/DIR), case summaries and their supporting documents, spot maps and other AEFI related communications such as letters, Government Orders (GOs) etc.
- Ensure the national AEFI guidelines and reporting formats are disseminated to the programme managers and other staff at the district and sub district level and ensure that there is a plan to train the staff at periodic intervals.
- Assist in responding to AEFI and support the districts in investigation, when requested.
- Strengthen AEFI surveillance in the state using the existing surveillance networks. Encourage AEFI reporting from government and private sector and encourage submission of nil reports. Ensure effective AEFI monitoring and supportive supervision.
- Review, analyze AEFIs reported through HMIS/RIMS and other reporting channels in the state and share feedback with Government of India and the districts in state.
- Monitor reported AEFI data for potential signals of previously unrecognized signals and vaccine related adverse events and make recommendations for further investigation.
- Review AEFI during state and district review meetings and workshops.
- Provide feedback of observations and recommendations of State AEFI committee, specimen testing results etc

Event

- Check if similar events have occurred in other districts by review of data, coordinate with the DIO(s) and provide technical assistance (e.g. specimen collection and shipment, handling the media etc) if requested for First Investigation.

- Coordination with other state departments such as state drug authorities, hospitals /laboratories, medical colleges and other private hospitals to deal with any referral/ testing or other procedures following AEFI.
- Ensure that the state communication plan is activated to handle any crisis

Post event

- Engage the State AEFI committee timely for final conclusion (causality assessment) of the reported serious AEFI. Ensure the completion of the preliminary and detailed investigation as per the stipulated timeline and coordinate with the district (and state) AEFI committees to complete the documentation and submission of the details to the national levels

6.4.6 National Level

Assistant Commissioner of Immunization Division, MOHFW:

- Review overall pattern of reports and investigations, revision of guidelines /SOPs, maintenance of National database of serious AEFI cases and providing feedback to the states.
- Conducting periodic evaluation of the AEFI surveillance system of the country.
- Arranging and co-coordinating the meeting of the National Expert Committee on AEFI on regular basis.

6.5 National Regulatory Authority (NRA), State Regulatory Authority (SRA), & Central Drug Laboratory (CDL- Kasauli and Kolkata)

AEFI is a vital functional component of the NRA (National Regulatory authority) essential not only for assurance of vaccine quality in the country but also for prequalification of vaccines. Core functions of the NRA are

- Marketing authorization and licensing activities,
- Post-marketing surveillance including surveillance for Adverse Events Following Immunization (AEFI)
- Coordination of Lot release process,
- Laboratory support,
- Regulatory inspections of Good Manufacturing Practices (GMP)
- Authorization and approval of clinical trials of vaccine.

Additional roles of NRA, SRA and CDL (Kasauli and Kolkata)

- Technical point of contact for vaccine testing - receive vaccine samples or initiate collection of samples (SRA/ NRA)
- Advise on vaccine quality and testing (NCL)
- Control and release each batch of vaccine individually, including recalling if necessary (NRA)
- Evaluate and monitor vaccine performance including safety.(NCL and NRA)

6.6 Performance of the AEFI surveillance system

6.6.1 Performance Indicators

The AEFI surveillance system needs to be regularly reviewed at all levels to ensure that the system is sensitive enough to identify and respond to AEFI rapidly. Some of the key indicators that help to monitor the system include

- Timeliness , completeness and accuracy of AEFI reporting
- Percentage of AEFI cases reported in Time
- Percentage of serious AEFI cases investigated on time using standard formats with complete documentation.
- Number (%) AEFI cases being investigated and FIR completed and sent by the district within 24 hours of notification
- Number (%) AEFI cases being investigated and PIR completed and sent by the district within 7 days of submission of FIR
- Number (%) AEFI cases being investigated and DIR completed and sent by the district within 90 days of submission of FIR
- Number (%) AEFI cases where final classification including causality assessment by state AEFI committee is completed within 30 days of receipt of DIR from districts
- Number (%) AEFI cases reviewed by National AEFI committee following receipt of reported AEFI cases from State at National level
- Number (%) causality assessments done for the reported serious AEFI cases by the State AEFI committees and forwarded to national AEFI committee
- Response to AEFI by the program particularly those related to programme error

6.6.2 Analysis of AEFI reports

It is essential that both non serious and serious AEFI are reported. This is particularly important in states and districts that are now rapidly improving their immunization coverage. In addition to basic time, place and person analysis that should be done by the district and state program managers from the data received, key analysis that will help the district document effectiveness of the AEFI surveillance system include

- Number of AEFI reports received monthly (serious and non serious AEFIs including clusters)
- Classification of reported AEFI by types
- Classification of AEFI by antigen
- Classification of events by causality assessment
- Unusual AEFI

6.7 AEFI secretariat

With the establishment of the state and the district AEFI committees, voluminous data is being received at the national level. It is essential to collate, analyze, interpret and respond to the same to arrive at a logical conclusion. The National AEFI committee recommended that the AEFI secretariat should

- Coordinate activities with Immunization Division, NRA, CDSCO, CBHI, E & I Division, and NCDC, IDSP, WHO / NPSP or other partner agencies.
- Liaise with State/ District AEFI committees, different Central Drug Laboratories.
- Assist in surveillance, response and follow-up of serious AEFIs and monitoring of unknown AEFIs
- Coordinate with States on causality assessment exercises
- Ensure / follow up on timeliness & completeness of data.
- Ensure Data collation, compilation and analysis.
- Design, develop and implement analysis tools.
- Provide feedback (program relevant inferences).
- Oversee documentation & publication.
- Liaise with National & International agencies.

-
- Facilitate activities of National AEFI committee (including administration & logistic support).
 - Facilitate National, State and District level workshops and trainings.

6.8 Liaison with the police and the district administration

Police officers and the district administration work in partnership with the public. They are citizen-focused, responding to the needs of individuals and communities. Some of their important priorities include maintaining law and order, tackling antisocial behavior, reducing theft, robbery and crime, supporting victims and providing a reassuring presence in the community.

Therefore serious AEFI resulting in death will also be investigated in parallel by the police and the district administration to rule out any criminal intent for the event. They would also be participating in the process of investigation, conducting autopsies, collecting specimens and testing the same in specialized laboratories.

It is important to remember that the goal of the district AEFI committee, the district administration and the police are identical i.e. to arrive at a conclusion on the cause of the adverse event that resulted in death. The AEFI committees are therefore encouraged to invite the police and district administration to participate in the AEFI investigation planning meetings, visit the sites together for investigation, and jointly collect specimens as far as possible. However, it is important to consider that the protocols for different agencies investigating the AEFI will be different and therefore the investigating officers need to handle the situation tactfully ensuring coordination between partners and stakeholders. They also need to be updated on the findings as the investigation proceeds logically to its conclusion.

Chapter 7

AEFI Committee

AEFI committees are established at District, State and National level. The objectives of AEFI committees are to strengthen AEFI reporting at all levels, ensure maintenance of national policy and standards, and ensure prompt and thorough investigation of serious AEFI. Periodical review of AEFI for trends of Non serious AEFIs reported through HMIS/ Routine immunization reporting/ RIMS etc. Experts in the committee will help in timely classification and assessment of causal association between the vaccine and the event.

AEFI committees provide technical inputs to review the factors leading to the adverse event and provide inputs to improve the system to provide safe and effective immunization. They are NOT intended to blame any health facility/ individual.

7.1 Composition of the AEFI Committee

The representative of the following specialists, programme officer, professional bodies should constitute members of the AEFI committee and the Immunization programme manager should be the member secretary.

- Epidemiologist / Public Health Specialist
- Representative from drug authority
- Pediatrician,
- Microbiologist,
- Neurologist,
- Pathologist,
- Forensic expert,
- Cold chain officer,

AEFI

- Member IDSP,
- Representative from local bodies like corporation
- Members from professional bodies like IAP, IMA
- Representatives from partner agencies can be on panel as ex-officio members and should be invited, when required,

Other members could be inducted as desired by National, state / region or district committee. If possible, the preference should be given for specialist working in medical colleges a part of the AEFI committee.

7.2 Terms of reference for AEFI committee at various levels

7.2.1 District AEFI Committee

Every District must constitute and establish a functioning AEFI committee with District Immunization Officer as member secretary. The members in the committee should include from the locally available resources persons representing the above mentioned field where ever possible. The concern Block Medical Officers (in charge) where AEFI has occurred could be the special invite to district AEFI committee. The committee to meet once every quarter or earlier as per need as per the following terms of reference (TORs).

- Analyze the FIR and plan for investigation of the AEFI as a team.
- Provide appropriate information to the drug authority on the important aspects of temporary suspension of the implicated batch of vaccine/ logistics.
- Prepare DIR based on the finding of the investigation of the AEFI.
- Outline the further course of action on the current AEFI.
- Analyze and review the quarterly AEFI data for any programmatic errors and remedial measure for the same.
- Participate in the State/National AEFI committee meeting if required for casualty assessment.
- Monitor and analyze non serious AEFI data every quarter.
- To support the spokesperson for media communication
- Where needed facilitate in propagating the message of reporting AEFI from all sectors (including private sector).

- Monitor the timely submission of completed investigation forms (FIR, PIR and DIR) along with supporting documents/medical record etc
- Communicate and share the conclusions and results of investigation with health workers and the community where warranted.
- Any other responsibility in context to vaccine safety that the committee would like to add.

7.2.2 State AEFI Committee

The Immunization Officer of the State will be the member secretary in State AEFI committee. The preference to be given for specialist from medical colleges to be inducted as members of the committee and the concern District Immunization Officers and other members of the district AEFI committee where AEFI has occurred could be the special invite. The committee to meet once every quarter or earlier as per need as per the following terms of reference (TORs).

- Desk review of the FIR, PIR and DIR for causality assessment.
- Inspection of the site visit and interview with the parents of the AEFI case and also interview of the Districts AEFI committee members, if required.
- Analysis of similar cases or clustering of cases in the State.
- Periodic review of the data base of AEFI case.
- To support the spokesperson for media communication

7.2.3 National AEFI Committee

The main role of the national AEFI committee is to

- To review the State AEFI committees report on a periodic basis.
- Assist in finalization of the AEFI bulletin.
- Assist the state AEFI committee when requested

Four sub committees would support the activities of the national AEFI committee, they include

1. Causality assessment sub committee
2. Operational group sub committee
3. Investigation sub committee
4. Media management sub committee

Chapter 8

Vaccine Risk communication and Handling of the Media

Vaccine risk Communication and Handling of the Media

The media is an important gateway to inform the public and shapes their view and attitudes towards vaccines and immunization. In the long-term, building partnerships with the media is key to keeping the public regularly informed about immunization, the benefits, and to motivate families and communities to make use of immunization services. The media is likely to publicize events where there are deaths or AEFI, where the national press has unearthed “ominous facts”, or where they have obtained information *before* the health professionals have done so. Health professionals may become the centre of a crisis if they are accused of not having done their job properly or were found not to be truthful. It will be useful for the AEFI Committee/immunization program managers to be prepared with the most useful ways to communicate with media during an AEFI.

The media likes: a fast response, accuracy and simplicity, statistics with explanation, context (part of a wider picture), comments or explanation from the highest authority possible, and both or multiple sides of the story. The AEFI Committee/Immunization Programme Managers may follow the guidelines given below for effective management of media during a crisis.

8.1 Advance preparedness

Effective communication with the media includes efficient coordination with the field staff, a plan, trained personnel, a budget, and practiced responses to potential issues around AEFI. It should be in place before an immunization campaign starts and as part of the on-going communication support to routine immunization programmes. A good media plan consists of the following:

AEFI

A database of journalists:

A list of print and electronic media journalists covering health (local, national, international) with contact information. Always use a database where updating can be done immediately in the master copy. Mention “updating date” somewhere on the page or the file name for easy recall. Update quarterly any changes in the media list.

Information packages:

Keep media informed through email or hardcopy by sending regular updates on any plans, programmes, decisions, etc. Sensitize media about health aspects like benefits of immunization and its impact globally and nationally. Prepare monthly or quarterly updates. An information package may contain the following documents both in hard copy and stored on a CD: Frequently Asked Questions (FAQs) on immunization in general, for specific disease, and AEFI; Fact Sheet or a Technical Brief on a specific vaccine preventable disease; Recent updates – progress made in India and outside – and a few case studies; graphs and illustrations; photographs; contact addresses of spokespersons (experts) that media can talk to. Please remember to check and permanently remove all old and outdated material from this information package.

Draft media release:

The draft media release must specifically answer the **6 W’s** for journalists:

- **Who** is affected/is responsible?
- **What** has happened? What is being done?
- **Where** has it happened?
- **When** did it happen?
- **Why** did it happen?
- **Will** it happen again?

Mention the name and contact details of the AEFI Committee (on the top), and the name and contact details of the spokesperson (the AEFI Committee may also recommend another name such as a medical expert) for further details should journalists have more questions (at the end). Keep these ready. Mention a “for more information, contact AEFI Committee” (with the relevant persons name) at the end of your communication with media so that the media can refer to the relevant person in case of any queries.

Information specific to media characteristics

Local media: May have broken the story. Read and believed by more people in the community than national media.

National media: Seen by government and national opinion leaders. Has a wide reach and influences national agendas.

International media: Seen and read in headquarters of international organizations. Has resources to produce investigative reporting. Can influence national agendas.

A spokesperson system:

Identify in advance an appropriate spokesperson (or several spokespersons in the different agencies). Share contact details of spokesperson(s) before an immunization campaign starts with all concerned focal points at the district, state and national levels. This limits the possibility of conflicting messages coming from different sources. Ensure spokesperson(s) has experience or some training in dealing with media.

Orientation workshops and field visits for media:

Regular orientation workshops and field visits for journalists will help them achieve a better understanding of immunization advantages as well as the complexities of an immunization programme. Orientation workshops and deliberations will also help to identify in advance the kind of questions or concerns that journalists specifically have. Always take note of all proceedings and discussions with journalists. This will help to be prepared with appropriate answers when required.

8.2 Media Management when an AEFI has occurred

While every single AEFI must be investigated in detail, all AEFI cases may not be crisis situation. A crisis often occurs from inaction rather than from taking appropriate action on AEFI.

Monitor-media:

When an AEFI occurs, substantive inaccuracies can get reported; for example, regarding the number of AEFI cases, gravity of the case, allegations of negligence, or simple rumors about vaccine procurement. The AEFI Committee should move very quickly to correct them, because the longer misinformation remains in the information environment, the more

difficult it becomes to correct. The AEFI Committee could take the following immediate actions:

- Analyze rumor, its level, and potential to cause damage.
- Anticipate how situations might evolve following response; prepare before responding.
- Deal with a simple mistake with a simple solution. If it is an isolated error, make a polite call to the reporter and offer to help the reporter with correct data and facts then and in the future.
- If the rumor is confined to a small audience, correct it within that group only. If the error is widely reported, you may call a media conference to present the correct facts before it leads to further damage or proves detrimental to the programme goals.
- Plan how to prevent future rumors.

Prepare messages:

The best messages get to the heart of the problem without lengthy explanations. Listeners and viewers remember that one key message if they remember nothing else. Try to repeat the message at least once during an interview with the media. For instance, here are two effective messages on immunization in general:

- Immunization is the most cost-effective health intervention.
- Immunization is the right of every child.

Some more examples of messaging specific to the situation

- Benefit of immunization in preventing disease is well proven.
- It is very risky not to immunize (risk of disease and complications).
- Before the introduction of vaccines, vaccine-preventable diseases caused thousand of death and/or disability. That situation would return without continued use of vaccines.
- Vaccines do cause some reactions, but these are rarely serious and hardly ever cause long-term problems (have data ready and available to substantiate this fact).
- We have a well-established immunization safety surveillance in place. Immunization safety is of paramount importance, and even the slightest suspicion of a problem is investigated.
- The AEFI is currently being investigated, but is likely to be coincidental/due to a local problem (depending on type of event), and the immunization programme must continue to keep the population safe from disease.

Prepare a media release:

An effective media release should include:

- A complete account of the event, framed in its context (e.g. an isolated event or a cluster of AEFI, or coincidental event). The media release must specifically answer the '6 Ws'
- Keep media release free from technical jargon.
- An outline of actions taken or planned (such as the AEFI investigation).
- A description of the cause of the event (but only when this is known with certainty).
- An assurance that corrective action has been taken or will be taken.
- Reference to any relevant publication, video material or web site.
- Sender's name and spokesperson's details.
- Limited to one page of matter (400-500 words max).
- Short sentences (not exceeding two lines).
- Quotes from key officials may be used after seeking their permission. The quotes must be positive and carry the key messages.
- Key message(s) are repeated.

Call a media conference:

Media conferences need to be used judiciously, as there are also dangers, especially if preparation for it is weak and the journalists are assertive (see Box 1 below). Especially when different stakeholders will be present, everything must be planned well in advance. Media conferences may need to be conducted if AEFI is being reported extensively and widely and there is a need to provide accurate facts and de-sensationalize the story. A media conference enables all journalists to have the same information, thus there is then less likely of event being 'sensationalized'. Consider the following steps when preparing for the media conference:

- AEFI Committee takes the lead but identifies who facilitates the press conference.
- If there are several members on the panel, agree beforehand on the key message(s) in response to the AEFI.
- Agree on roles of each panel member beforehand, including the type of questions (media, political etc. each panel member may best handle);

-
- Panel members must avoid contradicting each other in the press conference unless it is critical to clarify something incorrect that has been said.
 - Have a media kit ready and share it with journalists. The media kit may consist of a media release) with all the essential information, supplementary background information (e.g. on the benefits of immunization) and a set of frequently asked questions (FAQs) about immunization.

8.3 Post-AEFI actions

Keeping promises to the media:

If it has been promised that media will be kept updated about the investigation findings, make sure the media is updated by the promised date. If the findings have been delayed, ensure the media is informed because they would be expecting answers.

Providing answers to unanswered questions:

During media conferences, if a question could not be answered for any reason – for example due to absence of data, or if you were unprepared to answer the questions – get back to the media with the answers as soon as possible.

Keeping media informed about subsequent developments:

If any decision or action is taken at the highest levels following AEFI investigations or during the investigations, and the public must know about it, keep the media informed through a press release or hard copy document.

Some delicate questions that the spokesperson needs to be prepared with answers (questions documented from the field over the last few years)

1. Why does the government provide vaccines which cause bad reactions/death?
2. Why don't health authorities train vaccinators so that these accidents are avoided?
3. Why are injections for vaccines and other medical procedures still dangerous in our state/country?
4. Why are vaccines still given which damage our children with serious side effects?
5. Why parents are not told the truth about vaccines? Is there something that is being hidden?

Questions on specific vaccines

1. Has there been episode where children died after getting reconstituted measles vaccine?
 2. Does OPV (oral poliomyelitis vaccine) cause paralysis?
 3. Why should our children get OPV and risk paralysis when there are hardly any poliomyelitis cases in the country any more?
 4. Are vaccines contaminated during the manufacturing process?
 5. Could this vaccine have catalyzed a reaction if not caused, that led to death of child?
-

Annexures

Section A

FIRST INFORMATION REPORT (FIR)

(To be completed by the person reporting the AEFI and sent to MO - Immediately)

(Only for Serious Adverse Events Following Immunization)

Serious AEFI category (Encircle): **Death / Hospitalized / Cluster* / Disability**

State												District																	
Block/ Ward												Village/ Urban Area																	
Address of the site:																													
Reporting by (Name):												Today's Date:																	
Posted at:						Designation:						Time of preparing this form:						AM / PM											
Contact phone number (with STD Code):												Time sent to MO:												AM / PM					
Patient Name																													
Age (in months) / Date of Birth												Sex						Male						Female					
Father/Mother Name																													
Complete Address of the Case with landmarks (Street name, house number, village, block, taluk, Pin No., Telephone No. etc.)																													
P I N -																													
Date of Vaccination												Time of Vaccination																	
Name of recent Vaccine(s) given:																													
Date of first symptom												Time of first symptom																	
Current status (encircle): Death / Still Hospitalized / Recovered & Discharged / Left Against Medical Advice (LAMA)																													
Date of Death												Time of Death																	
Additional Information:																													

* Use separate form each case in a cluster

Section B

FIRST INVESTIGATION REPORT (FIR)

(To be completed by MO to District HQ within 24 hours of AEFI case notification)

(Only for Serious Adverse Events Following Immunization)

AEFI Case ID (To be assigned by DIO):												IND (AEFI) /												State Code						District Code						Year						Serial No.					
Reporting Medical Officer (Dr.) Name:												Date of filling FIR by MO:																																			
Posted at:						Designation:						Mobile No.						Fax No.:																													
Land Line (with STD Code):												Case Informed By:																																			
If MO disagrees with information in Section A, Please record details (with justification) here																																															
Patient Name																																															
Date of Birth												Age (in months)						Sex						Male						Female																	
Date of Notification												Date of Investigation																																			
Date of Vaccination												Time of Vaccination																																			
Date of Onset												Time of Onset																																			

Hospitalization No/ Yes	Date	Time of Hospitalization
Name and Address of hospital		
Outcome (encircle) Death / Still Hospitalized / Recovered & Discharged / Left Against Medical Advice (LAMA)		
If died, Date of Death	Time of Death	
Post mortem done? (encircle)	Yes**/ No / Planned on (date)	If Yes, Date Time

** Attach report (if available) with FIR

Details of vaccine, diluents & Vitamin-A given to the patient

(In the doses administered column write the dose received by beneficiary like 1st, 2nd, 3rd, booster and any other

Vaccine/Vit-A/Diluent	* Dose Administered	Name of Manufacturer (in BLOCK Letters)	Batch No.	Manufacturing Date	Expiry Date
BCG					
BCG Diluent					
DPT					
OPV					
Measles					
Measles Diluent					
Hep-B					
DT					
TT					
Vit-A					
Others					

Place of Vaccination: Govt. Health Facility / Outreach / Private Health Facility / Other _____ Session: SIA / Routine / Other _____
 Total number of beneficiaries immunized at session site: Pregnant women _____ Children _____
 Number of other beneficiaries who received vaccine from the SAME VIAL: _____

Signature of Reporting Medical officer _____ Email id _____

Section C The following information is to be completed by DIO & forwarded to GoI and State within 24 hours of receiving the above information

Proposed date of District AEFI committee review meeting for this case	
Proposed date of preliminary investigation	
Notes/comments:	
DIO: District Nodal Person (Officer forwarding this report)	
Name	Date
Designation	
Mobile No	Landline (with STD code)
Fax No	
Email id	Complete Office address (with Pin code)
Signature/ Seal	

To be set to : State Immunization Officer & Assistant Commissioner,
 Immunization division of Govt. of India, MOHFW, Nimal Bhawan, New Delhi - 110018
 Fax No. - 011 23062728 / email: aefiindia@gmail.com

Name _____ Case Id Number IND (AEFI) / State Code / District Code / Year / Serial No.

Section B Relevant Information of the patient prior to immunization :
If 'Yes', specify

Past H/o similar event	Yes / No
Reaction after previous vaccination	Yes / No
H/o allergy	Yes / No
Pre-existing illness / disorder	Yes / No
H/o hospitalization in last 30 days with cause	Yes / No
Recent H/o trauma with date, time, site and mode	Yes / No
For adult women	
+ Currently Pregnant?	Yes / No
+ Currently Breastfeeding	Yes / No
Family History of any disease or allergy	Yes / No
+ Natal history	• Full term / pre mature / post dated
+ Delivery	• Normal / Caesarian / Assisted birth / any complication (specify)
Was the patient on any concurrent medication for any illness (if Yes : name the drug, indication & Doses)	Yes / No / Unknown

Section C Details of first examination* of serious AEFI case

***Instructions -- Attach copies of ALL available documents and then complete additional information NOT AVAILABLE in existing documents (case sheet, discharge summary, case notes, post mortem reports etc). i.e.**

- If Patient has taken medical care - Attach copies of all available documents (including case sheet, discharge summary, laboratory reports and post mortem reports - if available) and complete only additional unavailable information below
- If patient has not taken medical care – Complete this form fully
- If the investigator has disagreement with the findings in any of the document(s) mentioned above, the same may be expressed here with justification

Source of information (circle all that apply) : Examination by the investigator/ Documents/ Verbal autopsy/ Other _____

If from verbal autopsy, please mention the source (circle) Name of the person who first examined the child: _____
Other sources (specify) _____

Signs and Symptoms in Chronological order:

The clinical details below are filled up by _____ Designation : _____

Date and time of onset of 1st symptoms _____ Date and time of examination : _____

Findings on initial examination that are NOT documented in the available documents or if the investigator disagrees with the information documented please record details (with justification) here

Consciousness Alert / drowsy / Unconscious other (specify) _____
Describe: _____

Vitals Pulse _____ Temperature _____ Respiratory rate _____ BP _____

Skin Rash / cyanosis / petechiae / pallor / jaundice / others (specify) _____
Describe: _____

Eyes Vision: Normal / Impaired
Pupil : Normal / Constricted / Dilated / Reacting to light

Hearing Speech Normal / Impaired (Describe)
Normal / Abnormal (Describe)

Name	Case Id Number	IND (AEFI) / <small>State Code</small> / <small>Distric Code</small> / <small>Year</small> / <small>Serial No.</small>
Neck	Neck Stiffness:	Present / Absent
Chest	Auscultation	Normal / Crepts / Rhonchi
	Heart sounds (Describe)	Normal / Murmur
Respiratory	Normal / Cough / Shortness of breath / others (specify) _____ Describe :	
GI	Pain abdomen / Vomiting / diarrhea / dysentery / others (specify) _____ Describe :	
Abdomen	Normal / Distended / Tender Liver : Not palpable / Palpable (If palpable specify size) Spleen : Not palpable / Palpable (If palpable specify size) (Describe)	
Limbs	Tone	
	• Upper Limbs	Normal / Increased / Decreased
	• Lower Limbs	Normal / Increased / Decreased
	Reflexes	
	• Biceps	Normal / Increased / Decreased / Absent
	• Triceps	Normal / Increased / Decreased / Absent
• Supinator	Normal / Increased / Decreased / Absent	
	Plantar	Extensor / Flexor

Any other abnormal signs.

Treatment provided:

Provisional diagnosis:

Add additional pages if needed

Name _____ Case Id Number IND (AEFI) / State Code / District Code / Year / Serial No

Section D Details of immunization provided at the site on the day AEFI reported

Number of beneficiaries immunized at session site. Attach record if available.	BCG	Hep-B1	OPV Birth	Hep B Birth	DPT-1	DPT-2	DPT-3	DPT-B1	DPT-B2	OPV-1	OPV-2
	OPV-3	OPV-B	Hep-B2	Hep-B3	Measles	DT	TT-1	TT-2	TT-B	Vit-A	Others

- a) Number of beneficiaries immunized from the implicated vaccine vial/ampoule
- b) When was the patient immunized? (encircle below)
- Within the first vaccinations of the RI session / Within the last vaccinations of the RI session / Unknow
 - Within the first few doses of the vial administered / Within the last doses of the vial administered / Unknow
- c) Number of OTHER beneficiaries immunized with the implicated vaccine vial in the same session
- d) Number of OTHER beneficiaries immunized with the implicated vaccine having the same batch number in the PHC/ CHC / district hospital/ other location specify _____
- e) Is this case a part of a cluster? Yes / No
- If yes, How many other cases have been detected in the cluster?
 - Did all the cases receive vaccine from the same vial? Yes / No
 - If No, Number of vials implicated

Section E Immunization practices at the location(s) where implicated vaccine was used (fill up this section by asking & or observing practice)

Any other abnormal signs:

• Temp of ILR (°C)		
• Temp of deep freezer (°C)		
• Correct procedure of storing vaccines, diluents and syringes followed?	Yes	No
• Any other item (other than RI vaccines and diluents) in the ILR or freezer?	Yes	No
• Partially used reconstituted vaccines in the ILR?	Yes	No
• Unusable vaccines (expired, no label, VVM stage 3 & 4, frozen) in the ILR?	Yes	No
• Unusable diluents (expired, manufacturer not matched, cracked, dirty ampoule) in the store?	Yes	No

Specific key findings/additional observations and comments:

Vaccine Transportation:

• Type of vaccine carrier used		
• Vaccine carrier sent to the RI site on the same day of vaccination?	Yes	No
• Vaccination carrier returned from the RI site on the same day vaccination?	Yes	No
• Conditioned ice-pack used?	Yes	No

Specific key findings/additional observations and comments:

Syringes and Needles Used:

• Are AD syringes used for immunization?	Yes	No
--	-----	----

If No, specify the type of syringes used: Glass/ Disposable/ Recycled disposable/ other specify _____

Specific key findings/additional observations and comments:

Name _____ Case Id Number _____ IND (AEFI) / State Code / District Code / Ward / District No

Reconstitution: (complete only if applicable, write NA if not applicable)

• Reconstitution procedure (encircle)			
Same reconstitution syringe used fro multiple vials of same vaccine?	Yes	No	NA
Same reconstitution syringe used for reconstituting different vaccines?	Yes	No	NA
Separate reconstitution syringe for each vaccine vial?	Yes	No	NA
Separate reconstitution syringe for each vaccination?	Yes	No	NA
• Are the vaccines and diluents from the same manufacturer?	Yes	No	NA

Specific key findings/additional observations and comments:

Injection technique: (Observe another session in the same locality – same or different place)

• Correct dose and route?	Yes	No
• Time of reconstitution mentioned on vial (in case of BCG, Measles, JE)?	Yes	No
• Non-touch technique followed?	Yes	No
• Contraindication screened prior to vaccination?	Yes	No
• How many AEFI reported from the PHC that distributed the vaccine in last 30 days?		
• Training on RI received by the vaccinator : (Specify the last training including date)	Yes	No

Specific key findings/additional observations and comments:

Private practitioner : (complete only if applicable, write NA for not applicable)

• Source of vaccine (encircle)	Government Supply	Procured from manufacturer	Pharmacy (Chemist)	Others
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Address of source from where vaccine was obtained for this patient

Status of cold chain at private clinic (encircle)	Satisfactory***/ Unsatisfactory/ Not observed (specify why _____)
Status of cold chain at procurement (encircle)	Satisfactory***/ Unsatisfactory/ Not observed (specify why _____)

***If it complies with ALL criteria in section E "Last vaccine storage point"

Additional observations and comments:

Section F Community Investigation (Please visit locality and interview parents/others)

Any similar events reported recently in the locality? Yes / No

If Yes, Describe:

If Yes, How many events / Episodes?

Of those effected, How many are

- Vaccinated: _____
- Not Vaccinated: _____
- Unknown: _____

Name _____ Case Id Number IND (AEFI) / State Code / District Code / Year / Serial No

Section G District AEFI Committee Review & Investigation Report

a) District AEFI committee review held? If Yes, then date of review by district AEFI committee	Yes D D M M Y Y	No
b) Any implicated samples sent for testing following District AEFI committee review?	Yes	No

Details of Vaccine/ Diluent samples sent to CDL Kasauli

Vaccine/Diluent Name	Used Vial/Amp. Quantity	Batch no, Lot no, date of expiry	Date Sent	Unused Vial/Amp. Quantity	Batch no, Lot no, date of expiry	Date Sent

Details of Syringe/ Needle samples sent to CDL Kulkata

Type of Syringes	Quantity	Batch no, Lot no, date of expiry	Date Sent	Type of Needles	Batch no, Lot no, date of expiry	Date Sent

c) Any biological product (CSF, Blood, Urine, etc) sent for testing? If yes, specify details of the lab; attach copy of report if available <small>Note: for AEFI resulting within 20 days following JE vaccine, send sample of CSF, Serum to nearest IV lab in Pune or Gorakhpur</small>	Yes	No
---	-----	----

d) Was local drug inspector involved in collecting additional samples?	Yes	No
--	-----	----

e) Other investigation, specify the findings and attach report.

Section H Preliminary Assessment (working hypothesis of AEFI committee)

Probable underlying cause of the adverse event:

Type of Adverse Event suspected based on preliminary findings (encircle)	Programme Error	Vaccine Reaction*	Coincidental	Injection Reaction	Unknown
--	-----------------	-------------------	--------------	--------------------	---------

Specific reasons for suspecting the above:

Corrective actions/recommendations:

*If an event is suspected to be related to vaccine(s)/ diluent(s), immediate efforts should be initiated by DDO/ District Cold chain Office to collate the information related to - Number of blocks supplied with the suspected batch and Number of beneficiaries vaccinated with the suspected batch.

Name _____ Case Id Number _____ IND (AEFI) / _____ State Code _____ District Code _____ Year _____ Sheet No. _____

Attached copies of reports / documents etc with this PIR:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

District AEFI Committee that conducted the preliminary investigation

Name	Designation	Phone #	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			

Section I DIO/District Nodal Person (Office forwarding this report)

Name Designation Date of submission to state/ national level.....
 Mobile No Landline (with STD code) Fax No.
 Email id Complete Office address (with pin code).....

 Signature/ seal..... Date.....

Please ensure that this PIR form (All 7 pages) reach:
 State Immunization Officer & Assistant commissioner (UIP), Immunization division of Govt. of India,
 MOHFW, Nirman Bhawan, New Delhi - 110108
 Fax No. - 011 23662728 or Email : aefiindia@gmail.com

Important Laboratory Addresses:

Send Vaccines and Diluents to	Send Vaccines and Diluents to	Send Vaccines and Diluents to	
CDL Kasauli	CDL Kolkata	NIV Gorakhpur	NIV Pune
Director Central Drugs Laboratory Central Research Institute Kasauli – 173204, Himachal Pradesh.	Director Central Drugs Laboratory Ministry of Health & Family Welfare Govt. of India 3, KYD Street Kolkata-700016	Director Officer in-Charge National Institute of Virology Gorakhpur Unit, BRD Medical College Campus Gorakhpur – 273013.	Director National Institute of Virology 20/ A. Dr. Ambedkar Road, Post Box No. 11, Pune - 411001 Maharashtra
Email : nclkasauli@bsnl.in	Email : cdikol@gmail.com	Email : cdikol@gmail.com	Email : nivick@pn3.vsnl.net.in
Phone : 0179-2272046 0179-2272060	Phone : 033-22299021 033-22870513	Phone : 0551-2506696	Phone : 020-26127301 020-26066790
Fax : 0179-2272049 0179-2272016	Fax : 033-222 99380 033-222 99541	Fax : 0551-2506698	Fax : 020-26122669 020-26126399

For State level use only

Note: *If an event is suspected to be related to vaccine(s)/ diluent(s), then immediate efforts should be initiated by State Immunization Officer and State Cold chain Officer to collate the information related to the districts supplied with the suspected batch and number of beneficiaries vaccinated with the suspected batch. The consolidated data needs to be sent to the govt. of India as early as possible

Section A

DETAILED INVESTIGATION REPORT (DIR)

(To be reported by district AEFI committee to State & within 90 days of filing FIR)

(Only for Serious Adverse Events Following Immunization - Death / Hospitalized / Cluster / Disability)

DIO to fill page 1 to 4 and SEPIO to fill page 4 & 5 to complete all details in BLOCK letters only

State	District	Case ID	IND (AEFI) /	State Code	District Code	Year	Serial No.
Block/ Ward	Village/ Urban Area						
Place of Vaccination (encircle) : Govt. Health Facility/ Private Health Facility / Other Specify _____							
Vaccination in (encircle) : SIA / Routine							
Type of site (encircle) : Outreach / SC / PHC / CHC / BPHC / Dist Hospital/ State Hospital / Medical Collage / Other specify _____							
Site Address:							
Name of Reporting Officer :				Date of filing DIR :			
Designation :				Posted at :			
Land Line (with STD Code) :				Mobile No.:		Fax No.:	
Patient Name*							
* Use separate form for each case in a cluster							
Date of Birth	D	M	Y	M	Y	Y	Y
Age (in months)							
Sex	Male Female						
Father's Name							
Mother's Name							
Complete Residential Address of the Case with landmarks (Street name, house number, village, block, khalid, Pin No., etc.)							
P H O N E -							
Date of Vaccination	D	M	Y	M	Y	Y	Y
Time of Vaccination	H	M	AM	PM			
Date of Onset	D	M	Y	M	Y	Y	Y
Time of Onset	H	M	AM	PM			
Date of Hospitalization	D	M	Y	M	Y	Y	Y
Time of Hospitalization	H	M	AM	PM			
Outcome (encircle)	Death / Still Hospitalized / Discharged / Left Against Medical Advice (LAMA) / Not Hospitalized						
Date of Death	D	M	Y	M	Y	Y	Y
Time of Death	H	M	AM	PM			
Date of Post Mortem	D	M	Y	M	Y	Y	Y
Time of Post Mortem	H	M	AM	PM			

Documents attached with this DIR: (Please retain the original and enclose ONLY COPIES)

Sl. No.	Documents	Date of submission/ completion	Attached with this document? (encircle)	Remarks (if any) and in case response is "No" then give reason
1.	First Information Report (FIR)		Yes / No	
2.	Preliminary Investigation Report (PIR)		Yes / No	
3.	Post Mortem Report done? (in case of death)		Yes / No	
4.	Result of any Pathology/Microbiology (Blood, CSF and Urine) test done?		Yes / No	
5.	Doctor's prescription/treatment record for this AEFI		Yes / No	
6.	Doctor's prescription/treatment record for other illness		Yes / No	
7.	Report of Laboratory test of vaccine/ diluent (if sent for testing)		Yes / No	

Patient Name	Case Id Number	IND (AEFI) /	State Code /	District Code /	Year /	Serial No.
8.	Report of Laboratory result of syringes/other drugs			Yes / No		
9.	Report of Laboratory test of vaccine/ diluent (if sent for testing)			Yes / No		If yes, specify & attach report

Refer to FIR & PIR for writing the following case summary. Remember to include the following points, add additional sheet as necessary :

1. Detailed history of signs and symptoms and signs in chronological order
2. Additional relevant information prior to immunization:
3. Status of immunization on the day of AEFI reported (Completed doses before the event):
4. Vaccines administered on the day of the event:
5. Examination findings on first examination of serious AEFI case:
6. Any other abnormal signs (if any observed during initial examination). Add additional pages if needed:
7. Progress of the patient's condition, treatment provided and diagnosis:
8. Details of Community investigation if conducted:

CASE SUMMARY

Please add additional sheets to complete...

Please add additional sheets to complete...

Patient Name _____ Case Id Number IND (AEFI) / _____ State Code / _____ District Code / _____ Year / _____ Batch No

DIO's report on District Assessment (working hypothesis of AEFI committee)

Probable underlying cause of the adverse event:

Type of Adverse Event Suspected based on preliminary findings (encircle)	Programme Error	Vaccine Reaction*	Coincidental	Injection Reaction	Unknown
--	-----------------	-------------------	--------------	--------------------	---------

Specific reasons for suspecting the above:

Corrective actions/recommendations:

Details of District AEFI Committee members who conducted the preliminary investigation

Name	Designation	Phone #
1.		
2.		
3.		
4.		
5.		
6.		
7.		

*If an event is suspected to be related to vaccine(s)/ diluent(s), then immediate efforts should be initiated by DIO/ District Cold chain Officer to collate the information related to - number of blocks supplied with the suspected batch and Number of beneficiaries vaccinated with the suspected batch and the consolidated data needs to be reported in the following table:

Name of Vaccine/Diluent	Batch of suspected vaccine/diluent	Total number of blocks supplied with suspected vaccine/diluent in the district	Total number of beneficiaries vaccinated with suspected batch in the district	
			Children	Adults/ Preg women

DIO/District Nodal Person (Office forwarding this report)

Name Designation..... Date of submission to state/ national level.....
 Mobile No Landline (with STD code) Fax No.
 Email id Complete Office address (with pin code).....
 Signature/ seal..... Date.....

Patient Name _____ Case id Number IND (AEFI) / State Code / District Code / Msnr / Serial No.

Section B

To be completed at State Level
(Office of State Immunization Officer)

Date of receipt of this DIR at State:

State/UT Causality Assessment Report

Note: State vaccine safety (AEFI) committee to complete causality assessment exercise and forward the report to Govt within 90 days of filing FIR.

Preparation for causality assessment check list for state EPI officer:

Sl. No.	List of document copies sent to the Govt of India	Availability (encircle)	Remarks (if any) / (if no why)
1.	First Information Report (FIR)	Yes / No	
2.	Preliminary Investigation Report (PIR)	Yes / No	
3.	Is the case summary completed in the DIR?	Yes / No	
4.	Report of Post Mortem Report done? (in case of death)	Yes / No	
5.	Report of any Pathology/Microbiology (Blood, CSF, Urine) Test done?	Yes / No	
6.	Copies of Doctor's prescription/treatment record	Yes / No	
7.	Copy of Laboratory Request Form (L.R.F)	Yes / No	
8.	Copy of Laboratory result of vaccine (if sent of testing)	Yes / No	
9.	Copy of Laboratory result of syringes/ other drugs (if sent of testing)	Yes / No	
10.	Any other document relevant to case	Yes / No	If Yes, specify & attach report

Conclusion of State vaccine safety and AEFI committee

Probable underlying cause of the adverse event:

Type of Adverse Event Suspected based on preliminary findings (encircle)	Programme Error	Vaccine Reaction*	Coincidental	Injection Reaction	Unknown

*** Causality: Very likely/Certain/ Probable/Possible/ Unlikely/Unrelated/Unclassifiable

(** Refer to the relevant section on the Operational Guidelines on AEFI Surveillance - 2010 MoHEW - Government of India)

Specific reasons for suspecting the above:

Corrective actions/recommendations:

Patient Name _____ Case Id Number _____ IND (AEFI) / State Code / District Code / Year / Serial No

Details of District AEFI Committee members who conducted the causality assessment

Name	Designation	Phone #
1.		
2.		
3.		
4.		
5.		
6.		
7.		

Date of review of the case																					Date of submission of report to GoI																					
----------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-------------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

*If an event is suspected to be related to vaccine(s)/ diluent(s), then immediate efforts should be initiated by DIO/ District Cold chain Officer to collate the information related to - number of blocks supplied with the suspected batch and Number of beneficiaries vaccinated with the suspected batch and the consolidated data needs to be reported in the following table:

Name of Vaccine/Diluent	Batch of suspected vaccine/diluent	Total number of blocks supplied with suspected vaccine/diluent in the district	Total number of beneficiaries vaccinated with suspected batch in the district	
			Children	Adults/ Preg women

State Nodal Person (Officer forwarding this report)

Name Designation..... Date of submission to state/ national level.....
 Mobile No Landline (with STD code) Fax No.
 Email id Complete Office address (with pin code).....
 Signature/ seal Date.....

Please ensure that this DIR form reaches:

Assistant Commissioner Immunization Division,
 Immunization division of Govt. of India, MOHFW, Nirman Bhawan, New Delhi - 110108
 Fax No. - 011 23062728 or Email : aefindia@gmail.com

Section B

For use at National Level
 (Office of Assistant Commissioner - Immunization Division)

Date of receipt of DIR from District	D	D	M	M	Y	Y	Y	Y
Date of receipt of DIR from State (with Causality assessment report)	D	D	M	M	Y	Y	Y	Y

AEFI - LABORATORY REQUESTION FORM (LRF)

(To be completed by the Drug Inspector/DIO. LRF should be accompanied with specimens)

(For Serious Adverse Events Following Immunization)

AEFI category (Encircle) : **Death / Hospitalized / Cluster / Disability**

State	Case ID	IND (AEFI) /	<small>State Code /</small>	<small>District Code /</small>	<small>Year /</small>	<small>Serial No.</small>					
District											
Block											
Name of Drug Inspector/DIO:			Date of filling LRF:								
Designation:			Mobile No.:								
Land Line (with STD Code):			Fax No.:								
Case Name											
Date of Birth					Age (in months)	Sex Male Female					
Complete Address of the Case with landmarks (Street name, house number, village, block, taluk, Pm No., Telephone No. etc.)											
P	I	N	-	P	H	O					
Date of Vaccination					Date of Onset						
Date of collection of specimen					Time of collection of specimen						

1. Precise description of samples:

a) For vaccine/diluents specimens: (to be transported in reverse cold chain)

Mention vaccine/diluent	Quantity Sent	Name of Manufacturer (in BLOCK Letters)	Batch No.	Manufacturing Date	Expiry Date

b) For logistics specimens: (AD, Reconstitution, Disposable syringes)

Mention vaccine/diluent	Quantity Sent	Name of Manufacturer (in BLOCK Letters)	Batch No.	Manufacturing Date	Expiry Date

c) For Biological product specimen: (CSF, Blood, Urine, etc)

--

Name of AEFI Case: _____ Case ID: IND (AEFI) / State Code / District Code / Year / Serial No.

2. Test requested:

--

3. Preliminary clinical diagnosis (working hypotheses) of district AEFI committee:

--

4. Name & complete address of officials to whom laboratory results should be sent:

Send to	Complete address	Phone/Fax	Mobile	Email-ID
State Drug Controller				
State Cold Chain Officer				
State EPI Officer				
District Immunization Officer (DIO)				
Others (specify)				

To be completed lab officials after receiving the specimen

Date of receipt of specimen at laboratory	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> </tr> </table>										
Name of person receiving specimen(s) at laboratory											
Condition of specimen upon receipt at lab (encircle)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">Good*</td> <td style="width: 33%; text-align: center;">Poor</td> <td style="width: 33%; text-align: center;">Unknown</td> </tr> </table>	Good*	Poor	Unknown							
Good*	Poor	Unknown									
Comments by pathologist, virologist or bacteriologist:											

Date specimen results sent from this lab _____

Name of laboratory professional _____

Signature _____

Landline No.: _____ Fax No.: _____ Email Id: _____

* Criteria for "good" condition: Samples sent as per AEFI guidelines.

Role and responsibilities in response to AEFIs

The following table summarizes the role and responsibilities in response to a AEFI case, (for details refer to page 6 and for treatment guidelines refer Annexure 6a).

Situation	Action	Person	Timeline
Village			
Mild symptoms like fever, pain after vaccination	<ul style="list-style-type: none"> Advise cold sponging & Inform ANM/HW(M) 	ASHA/AWW	Same day
Injection Site Abscesses, excessive Crying etc	<ul style="list-style-type: none"> Advise cold fomentation for abscesses & Inform ANM/HW(M) 		Immediately
Serious AEFI	<ul style="list-style-type: none"> Inform ANM/MO 		Immediately
Sub-centre			
Mild symptoms like fever, pain after vaccination	<ul style="list-style-type: none"> Appropriate treatment at local level 	ANM / HW(M)/ LHV	Same day
Injection Site Abscesses, excessive Crying etc	<ul style="list-style-type: none"> Give first –aid and refer to PHC/CHC 		At the earliest/Same day
Serious AEFI	<ul style="list-style-type: none"> Give first-aid and Immediately refer to nearest health facility Inform MO-I/C of PHC 		Immediate/Half hour
PHC/CHC			
Injection Site Abscesses, excessive Crying etc	<ul style="list-style-type: none"> Appropriate treatment 	Medical Officer / M.O.-I/C	Initiate treatment same day
Serious AEFI	<ul style="list-style-type: none"> Appropriate management with emergency drugs. If the patient requires further specialized treatment, stabilize the patient and refer to nearest facility (District Hospital/Medical College) for further management Inform District Immunization Officer 		Immediate
District Hospital			
Serious AEFI	<ul style="list-style-type: none"> Appropriate management of patient 	Paediatrician / Medical Officer	Immediate
	<ul style="list-style-type: none"> Rush a team to the sub-centre/ village where session was conducted to find about any other similar AEFI case 		At the earliest

Treatment guidelines for reportable AEFIs

AEFI	Treatment	Vaccine
Vaccine associated paralytic poliomyelitis (presenting as AFP)	No specific treatment available; supportive care.	OPV
Anaphylactoid reaction (acute hypersensitivity reaction)	Self-limiting, Anti-histamines may be useful	All
Anaphylaxis	Adrenaline Injection (See Appendix 6.4), CPR, Hydrocortisone, Oxygen, IV Fluids if facility exist	All
Disseminated BCG infections	Should be treated with anti-tuberculosis regimens including isoniazid and rifampicin.	BCG
Encephalopathy	No specific treatment available; supportive care.	Measles, Pertussis
Fever	Symptomatic; paracetamol. Give extra oral fluids. Tepid sponge or bath. In cases of high and extreme fever, other signs and symptoms should be sought and reported/managed as appropriate.	All
Hypotonic, hypo responsive episode (HHE or shock-collapse)	The episode is transient and self-limiting, and does not require specific treatment. It is not a contraindication to further doses of the vaccine.	Mainly DPT, rarely others
Injection site abscess	Incise and drain; Antibiotics if bacterial.	All injectable vaccines
Lymphadenitis (Includes suppurative lymphadenitis)	Heals spontaneously over months and best not to treat. If lesion is sticking to skin or already draining, surgical drainage and local instillation of anti-tuberculosis drug. Systemic treatment with anti-tuberculosis drugs is ineffective	BCG
Osteitis/ Osteomyelitis	Should be treated with anti-tuberculosis regimens including isoniazid and rifampicin.	BCG
Persistent Inconsolable screaming	Settles within a day or so; analgesics may help.	DPT, Pertussis
Seizures	Self-limiting; supportive care; paracetamol and cooling if febrile; rarely anticonvulsants.	All, especially Pertussis, Measles
Sepsis	Critical to recognize and treat early. Urgent hospitalization for intravenous antibiotics and fluids.	All injectable vaccines
Severe local reaction	Settles spontaneously within a few days to a week. Symptomatic treatment with analgesics. Antibiotics are inappropriate.	All injectable vaccines
Toxic shock syndrome (TSS)	Critical to recognize and treat early. Urgent hospitalization for intravenous antibiotics, steroids and fluids.	All injectable vaccines mainly measles

Recognition and Treatment of Anaphylaxis

Anaphylaxis is a very rare (estimated as once every million doses of vaccine given) but severe and potentially fatal allergic reaction. When anaphylaxis does occur, the patient must be diagnosed properly, treated and managed urgently by trained staff and transferred to a hospital setting.

There is a high risk that health workers who lack training will misdiagnose faints (vasovagal syncope) and dizziness following immunization for the onset of anaphylaxis. Vaccinators, paramedics and physicians should be adequately trained so that they are able to distinguish anaphylaxis from fainting (Vasovagal syncope), anxiety and breath-holding spells, which are common benign reactions.

During fainting, the individual suddenly becomes pale, loses consciousness and collapses to the ground. Fainting is sometimes accompanied by brief clonic seizure activity (i.e., rhythmic jerking of the limbs), but this requires no specific treatment or investigation. Fainting is relatively common after immunization of adults and adolescents, but very rare in young children. It is managed by simply placing the patient in a recumbent position. Recovery of consciousness occurs within a minute or two, but patients may take some more time to recover fully.

An anxiety spell can lead to pale, fearful appearance and symptoms of hyperventilation (light-headed, dizziness, tingling in the hands and around the mouth). Breath holding occurs in young children and will lead to facial flushing and cyanosis. It can end in unconsciousness, during which breathing resumes.

Recognition of anaphylaxis

Anaphylaxis is a severe reaction of rapid onset (usually 5-30 minutes after the injection) characterized by circulatory collapse. The early signs of anaphylaxis are generalized erythema and urticaria with upper and/or lower respiratory tract obstruction. In more severe cases, limpness, pallor, loss of consciousness and hypotension become evident in addition. Vaccinators should be able to recognize the signs and symptoms of anaphylaxis in the box below.

Clinical Progression	Signs and symptoms of anaphylaxis
Mild, Early Warning Signs	Itching of the skin, rash and swelling around injection site. Dizziness, general feeling of warmth
	Painless swellings in part of the body e.g., face or mouth. Flushed, itching skin, nasal congestion, sneezing, tears.
	Hoarseness, nausea, vomiting
	Swelling in the throat, difficult breathing, abdominal pain
	Late, Life-threatening Symptoms

In general, the more severe the reaction, the more rapid is the onset. Most life-threatening reactions begin within 10 minutes of immunization. That is why it is advised that the beneficiary be kept under observation for at least 30 minutes after the injection.

Unconsciousness is rarely the sole manifestation of anaphylaxis - it only occurs as a late event in severe cases. A strong central pulse (e.g. carotid) is maintained during a faint, but not in anaphylaxis. Anaphylaxis usually involves multiple body systems. However, symptoms limited to only one body system (e.g., skin itching) can occur, leading to delay in diagnosis. Occasional reports have described reactions where symptoms recur 8 to 12 hours after onset of the original attack and prolonged attacks lasting up to 48 hours.

Distinguish anaphylaxis from Faint (Vasovagal reaction)

	Faint	Anaphylaxis
Onset	Usually at the time or soon after the injection	Usually some delay between 5-30 minutes after injection
System		
Skin	Pale, sweaty, cold and clammy	red, raised and itchy rash; swollen eyes, face, generalized rash
Respiratory	Normal to deep breaths	Noisy breathing from airways obstruction (wheeze or stridor)
Cardiovascular	Bradycardia, Transient Hypotension	Tachycardia, Hypotension
Gastrointestinal	Nausea, Vomiting	Abdominal cramps
Neurological	Transient loss of consciousness, good response once prone	loss of consciousness, little response once prone

Treatment of anaphylaxis:

Once the diagnosis is made, **consider the patient as being in a potentially fatal condition, regardless of the severity of the current symptoms.** Begin treatment immediately and, at the same time, make plans to transfer the patient immediately to the hospital (if not already in a hospital setting).

Role of Adrenaline:

Adrenaline (epinephrine) stimulates the heart and reverses the spasm in the lung passages, and reduces edema and urticaria, thus countering the anaphylaxis. But this very potent agent can cause irregular heartbeat, heart failure, severe hypertension, and tissue necrosis if used in inappropriate doses.

Every health facility should have health staff trained in treatment of anaphylaxis and should have rapid access to an emergency kit with adrenaline, and be familiar with its dosage and administration. The expiry date of the adrenaline should be written on the outside of the emergency kit and the whole kit should be checked three or four times a year. Adrenaline that has a brown tinge must be discarded. The adrenaline has a short expiry life, so monitor the expiry date on regular basis.

Steps in initial management:

- If already unconscious, place the patient in the recovery position and ensure that airway is clear.
- Assess heart rate and respiratory rate (if the patient has a strong carotid pulse, he/she is probably not suffering from anaphylaxis).
- If appropriate, begin cardiopulmonary resuscitation (CPR).
- Give adrenaline 1:1000 (See below for correct dose for age or weight) by deep intramuscular injection into the opposite limb to that in which the vaccine was given. (Subcutaneous administration is acceptable in mild cases) **and** give an additional half dose around the injection site (to delay antigen absorption).
- If the patient is conscious after the adrenaline is given, place his/her head lower than the feet and keep the patient warm.
- Give *oxygen* by face mask, if available.
- Call for professional assistance but never leave the patient alone. Call an ambulance (or arrange other means of transport), **after** the first injection of adrenaline, or sooner if there are sufficient people available to help you.
- If there is no improvement in the patient's condition within 10-20 minutes, of the first injection, **repeat** the dose of adrenaline up to a maximum of three doses in total. Recovery from anaphylactic shock is usually rapid after adrenaline.

- Where facility exists, Rapid IV infusion of physiologic saline solution, Ringer lactate solution to maintain blood pressure.
- Corticosteroids must be used in all cases of anaphylaxis except that are mild and have responded promptly to initial therapy.

Record, or get someone to record, vital signs (pulse rate, respiratory rate and blood pressure), as well as time and exact dose of any medication given. Make sure the details accompany the patient when s/he is transferred.

Mark the immunization card clearly so the individual *never* gets a repeat dose of the offending vaccine. At a suitable moment, explain to parents or relatives the importance of avoiding the vaccine in the future.

Report the occurrence of anaphylaxis to the appropriate officer by phone followed by the reporting form.

Adrenaline dosage: 1:1000 adrenaline (epinephrine) at a dose of 0.01 ml/kg up to a maximum of 0.5 ml injected intramuscularly (or subcutaneously in very mild cases) if the weight of the patient is unknown, an approximate guide is:

	Less than 2 years	0.0625 ml	(1/16 th of a ml)
	2-5 years	0.125 ml	(1/8 th of a ml)
	6-11 years	0.25 ml	(1/4 th of a ml)
	11+ years	0.5 ml	(1/2 of a ml)



WORLD HEALTH ORGANIZATION

SAFETY OF MASS IMMUNIZATION CAMPAIGNS

To ensure safety during mass immunization campaigns with injectable vaccines

Mass Immunization campaigns pose specific safety challenges, due to their objective of immunizing large populations over a short period of time and often being conducted outside the normal healthcare setting. Two of the most notable challenges are injection safety and adverse events following immunization (AEFI). Firstly, with respect to injection safety, the large number of injections to be administered and the large volume of waste the probability that breaches in safety may occur. Secondly, with respect to AEFI, there might be the perception of increased rates of AEFI. Reasons for this include the large number of doses being given over a short period of time and the administration of vaccine to a wider, usually older, age group. If not prevented or managed properly, these safety issues can result in transmission of infections, impaired public and donor confidence in the campaign, and ultimately, reduced coverage and public health impact. However, one can avoid such problems by considering safety issues from the start of the campaign. Components to ensure safety

include:

1. Assessing the existing injection safety situation
2. Preparing a detailed campaign plan which addresses key issues identified by the assessment.
3. Implementing the plan.
4. Monitoring the results.

Managers also need to ensure that they have a simple and timely monitoring system for adverse events for campaigns. Such a system not only supports the ongoing campaign, but also provides opportunities to identify key immunization and injection safety issues. These issues should then be addressed in routine immunization activities and included in a longer term immunization safety plan.

The main elements in ensuring immunization safety during a mass campaign are:

- An assured source of safe vaccines, safe injection supplies and other materials.
- Measures to ensure safety of vaccine administration.
- Measures to ensure safe sharps waste management.
- A system for AEFI monitoring and management.

- An advocacy and safety awareness strategy for the public and health staff.
- A budget to ensure funding of all planned components.



Checklist

Detailed campaign plans must

- Identify all key players and partners
- Plan, budget for and order adequate supplies of all necessary items
- Assess the current injection safety situation
- Include a detailed budget with costs of all safety components
- Plan for staff training and media messages
- Include safety in the campaign from the start
- Monitor, document and disseminate results
- Evaluate and identify lessons learned

Safe vaccine administration

- Use WHO/UNICEF pre-qualified or nationally approved vaccine and injection material
- Bundled distribution of vaccine and diluent with reconstitution syringes, auto-disable (AD) syringes and sharps boxes to the immunization sites
- Emphasize need for sterile technique, correct reconstitution and safe administration
- Train healthcare workers in proper techniques
- Ensure traceability of vaccine by manufacturer and lot number

Sharps waste management

- Assess local regulations and possibilities for sharps treatment and disposal
- Identify practical, simple solutions for waste collection and disposal
- Ensure availability of sharps waste disposal facilities, adequate safety boxes.
- Plan transportation, storage and disposal procedures before the campaign begins
- Provide clear instructions and guidelines for health staff on disposal

- Monitor disposal on a daily basis

AEFI Management and monitoring

- Assess or set up AEFI monitoring system
- Develop rapid reporting channels
- Decide which AEFI are to be reported and which contraindications to observe
- Train health care workers to investigate and manage AEFI and respond to rumours

- Explain to key people involved in the campaign why the campaign may result in the perception of increased rates of AEFI.
- Plan and transmit media messages on the campaign which address locally perceived safety concerns.
- Form an AEFI review committee
- Keep alert for “issues” and rumours

Words of advice

- Campaign policies and strategies should be identified well in advance of the campaign.
- Practical, country-specific solutions for sharps waste management should be identified and planned well in advance.
- All supplies and materials should be ordered at least six months before the campaign.
- Roles and responsibilities for the campaign should be clearly stated from the start and should include deadlines for completing all tasks.

- All players and partners (including nongovernmental organizations, medical and nursing associations, religious groups, etc.) should be contacted to help disseminate safety awareness messages.
- Regular monitoring throughout the campaign, followed by a final evaluation should be conducted so as to identify successes, problems and lessons learned. The findings should then be disseminated to all partners.

Key elements

Planning for mass campaigns, including safety components

- Identify the different key players and clearly assign activities, roles and responsibilities to each player.
- Ensure that campaign advocacy messages include safety issues.
- Conduct an assessment of current injection safety practices to assess the situation and identify the needs and challenges for the forthcoming campaign. The standard WHO tool for the assessment of injection safety practices might be considered for this.
- Include the following safety components in immunization mass campaigns:

1. A detailed budget with identified funding sources;
 2. A micro-plan for distributing vaccines, diluents, injection and reconstitution materials, and safety boxes;
 3. A plan for training on safe injections and AEFI monitoring;
 4. A comprehensive waste disposal plan;
 5. The information flow on AEFI;
 6. A crisis management plan with communication strategies to prevent rumours from endangering the campaign.
- Prepare “Questions and Answers” for the media on the background for the campaign and the potential for AEFI.

- Decide on a protocol for treatment of anaphylaxis, and provide the necessary training, drugs and equipment.
- Review contraindications to vaccination (e.g. AIDS) and implications for the campaign; train staff accordingly.
- Plan to monitor activities, successes and problems through routine reporting by all vaccination sites.
- Plan from the start to undertake a final evaluation and use this to develop a long-term plan of action to address the problems and issues that have been identified. Disseminate lessons learned so that others can learn from the experience.

Vaccine Administration	Sharps Waste Management	AEFI Monitoring
<ul style="list-style-type: none"> • Procure vaccines, AD syringes and safety boxes (and reconstitution syringes if necessary), from pre-qualified WHO/UNICEF or national regulatory authority-approved sources. • Ensure that quantities of all supplies match and that all distribution is bundled. Plan logistics carefully to ensure availability of all supplies at all vaccination posts. • Place orders well in advance (at least six months) before the start of the campaign. • Raise health care worker awareness on the need for safety throughout the campaign • Needles should never be recapped but must be placed into an approved safety box or puncture-resistant container immediately, and disposed of safely as soon as possible after use. • The training of staff at each level must include reconstitution of freeze-dried vaccine (use only the diluent supplied with the vaccine, use whole amount of diluent), the use of AD syringes and of the need for proper disposal in a safety box. 	<ul style="list-style-type: none"> • The safe disposal of used injection equipment is one of the most important issues in assuring injection safety. There is no single, universally accepted method, but a locally acceptable solution needs to be identified and agreed upon with all partners before the campaign. • Assess local possibilities of sharps treatment and disposal (e.g. identify functioning incinerators, sites for burning, re-cycling, safe burial, etc.). • Construct incinerators where needed, or find temporary treatment sites. • Plan for transportation, storage and treatment of sharps waste. Safety boxes should be numbered so as to verify their return to the destruction point. • Identify practical, simple solutions that can be implemented during the campaign. Use the waste disposal plan and system developed for routine sharps waste management in the future. (Possibilities include incineration, burning, recycling, safe burial.) • Prepare clear instructions and guidelines for health staff on sharps disposal and waste management. • Instruct personnel on practices recommended for the campaign and monitor the compliance 	<ul style="list-style-type: none"> • Institute a simple surveillance system for adverse events, if one does not exist already, with case definitions, a reporting form and instructions on how and where to report. • Monitor the distribution and use of all vaccine lots. • Ensure routine reporting and managing of AEFI at vaccination sites/clinics through training staff at all points where AEFI might occur, points for acute AEFI and points for delayed AEFI. • Maintain monitoring for at least four weeks after the campaign and introduce as a permanent system wherever possible. • Estimate the expected rates of AEFI for the vaccine(s) to be used, and the differences in background rates of diseases in target age groups involved in the campaign. Use these baseline figures to compare with actual rates occurring in the campaign. • Identify a focal point and form a committee to receive and review reports of AEFI during the campaign. • Ensure rapid response to AEFI with the necessary investigation and correction of potential programmatic errors. • Be sensitive to rumours that might arise about AEFI and follow them up actively.

Ordering code: WHO/V&B/02.10

This document is available on the Internet at: <http://www.who.int/vaccines-documents>

Additional information on immunization safety can be obtained on the Internet at

<http://www.who.int/vaccines>

Immunization Safety Priority Project

Department of Vaccines and Biologicals

World Health Organization

20 Avenue Appia, CH-1211 Geneva 27, Switzerland

Fax: +41 22 791 4210; Email: epidata@who.int

World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland

www.who.int/vaccines





WORLD HEALTH ORGANIZATION

ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI): CAUSALITY ASSESSMENT

AIDE MEMOIRE

Purpose: This aide-mémoire serves as a guide to a systematic, standardized causality assessment process for serious adverse events following immunization (including clusters). It is intended to be used by staff at the national (or first sub-national) level.

AEFI causality assessment overview

All reported AEFIs require verification of the diagnosis, coding, review, collation and storage; if an AEFI is serious, it requires triage for systematic, standardized causality assessment. Many AEFIs, including serious ones, may be coincidental while others are well known to be vaccine related (e.g., oral polio vaccine-associated paralytic polio [VAPP]).

Causality assessment is the systematic review of data about an AEFI case to determine the likelihood of a causal association between the event and the vaccine(s) received.

Causality assessment is a critical part of AEFI monitoring and enhances confidence in national immunization programmes. Whether an AEFI is, or is not, attributable to the vaccine or the vaccination programme determines what, if any, steps need to be taken to address the event.

Causality assessment is important for:

- 1) identification of urgent problems for investigation/action;
- 2) identification of programmatic and batch problems;
- 3) detection of signals for potential follow up and research;
- 4) basis for estimation of rates of serious AEFIs;
- 5) comparison of AEFIs between vaccine products;
- 6) validation of pre-licensure AEFI data.

Causality assessment outcomes help raise awareness of vaccine-associated risks among health-care workers; this, combined with knowledge of benefits of immunization, forms the basis of vaccine information for parents and/or vaccinees.

The quality of the causality assessment depends upon (1) the quality of the AEFI case report and the effectiveness of the reporting system, and (2) the quality of the causality review process. Poor quality causality assessment can lead to erroneous conclusions, crises and loss of confidence in the national immunization programme.

Causality assessment of adverse events with vaccines versus drugs

Many safety monitoring systems deal with vaccines and drug products together yet there are important differences between them that affect causality assessment.

- **Vaccines** are given to healthy populations and mostly (infants) at a vulnerable age; they are elective, have a complex composition (biological products), immunological considerations in addition to pharmacological, may cause the illness they are meant to prevent (e.g., VAPP), have a short duration of exposure, a "long" time for response, and "minor" adverse events are important as they may indicate programme error.
- **Drugs** are given to ill populations and mostly adults, they are rarely elective, challenge/dechallenge/rechallenge, chemical products, pharmacological considerations mainly, longer exposure, many adverse events reported, many classes of drugs, and minor adverse events rarely important.

Expertise needed for causality assessment of vaccine adverse events is different from that needed for causality assessment of drug adverse events.

Routine AEFI review and triage

All AEFIs need to be screened and triaged by trained immunization programme staff to determine the subsequent steps needed (follow up, action, addition to database, analysis, reference for systematic causality assessment, etc.).

AEFI must be reviewed to verify the diagnosis and the timing with respect to immunization, and to classify them on the basis of standardized national case definitions.

1 Standardized case definitions for some AEFIs are available from the Brighton Collaboration at (<http://www.brightoncollaboration.org>). Use of these definitions is encouraged, especially for serious cases where systematic standardized causality assessment is required.

Systematic causality assessment

All serious AEFIs and signals, defined below, require systematic causality assessment (see Checklist, Section C, page 2).

Serious AEFI¹

1) WHO standard definition for drug and vaccine adverse events is "any untoward medical occurrence that results in death, hospitalization or prolongation of hospitalization, persistent or significant disability/incapacity, or is life threatening".

2) Additional AEFIs that need systematic causality assessment are:

- AEFIs that may be caused by a programme error, e.g., a cluster² of bacterial abscesses;
- serious unexplained AEFI occurring within 30 days after vaccination and not listed in product label;
- events causing significant parental or community concern.

Signal: Reported information on possible causal relationship between AEFI and vaccine; relationship previously unknown or incompletely documented.

WHO categories for causality³

Use step-by-step guide (see Checklist, Section C, page 2) to determine category.

Very unlikely/Certain⁴: A clinical event with a plausible time relationship to vaccine administration and which cannot be explained by concurrent disease or other drugs or chemicals.

Probable: A clinical event with a reasonable time relationship to vaccine administration; is unlikely to be attributed to concurrent disease or other drugs or chemicals.

Possible: A clinical event with a reasonable time relationship to vaccine administration, but which could also be explained by concurrent disease or other drugs or chemicals.

Unlikely: A clinical event whose time relationship to vaccine administration makes a causal connection improbable, but which could be plausibly explained by underlying disease or other drugs or chemicals.

Unrelated: A clinical event with an incompatible time relationship and which could be explained by underlying disease or other drugs or chemicals.

Unclassifiable: A clinical event with insufficient information to permit assessment and identification of the cause.

1 "Severe" is not synonymous with "serious".

2 A "cluster" is two or more AEFIs related in time, place and/or by vaccine.

3 Adapted for vaccines from original WHO categories available at <http://www.who/umc.org/index2.html>

4 Can be certain in rare instances where there is a demonstrated relationship e.g., VAPP or mumps vaccine-related aseptic meningitis with isolation of the vaccine strain.



Checklist

A. Be prepared

- Develop a centralized system to verify diagnosis, review, code, collate, store reports and analyse AEFI data.
- Establish a national (technical) advisory committee. Ensure independence, breadth and depth of technical expertise needed for quality causality review. Provide administrative support to this committee.
- Adopt standard case definitions for AEFI (Brighton Collaboration definitions if available or national case definitions). Define signal for programme purposes.
- Define a routine process and adopt criteria for referral of AEFI cases for a systematic causality assessment by the committee.
- Define **frequency of meetings** for systematic causality assessment and triggers for exceptional (i.e., urgent) reviews. Develop a process for action on recommendations arising from causality assessment.

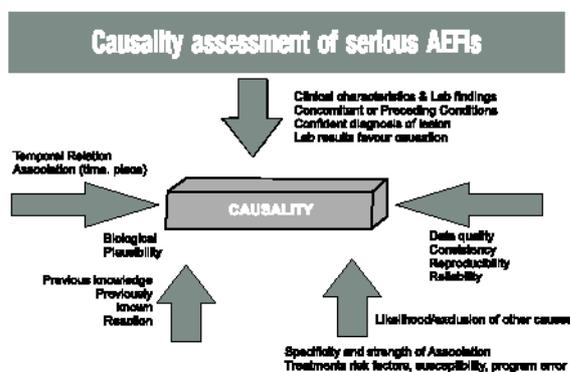
B. Receive and process reports at regional/national level

- Preliminary review of AEFI: verify diagnosis, timing of event in relation to immunization, if event meets definition, if it fits criteria for referral for systematic standardized causality assessment (see under Systematic causality assessment, page 1). Code, collate, store reports and analyse data.
- For cases referred for systematic standardized causality assessment: verify case information and gather more data in a timely manner. Prepare case file for review, e.g., make information in the file anonymous.

C. Conduct systematic standardized causality assessment using the step-by-step guide below

1. Verify reason for reporting: diagnosis; whether serious..
2. Evaluate and assess factors.
 - 2.1 Is this event known to be related to the vaccine? (**Consistency of findings, strength of association.**)
 - 2.2 What is the frequency of occurrence of this adverse event? Very common (>1/10); common (>1/100); uncommon (>1/1000); rare (>1/10 000); very rare (<1/10 000), or not previously reported.
 - 2.3 Are similar events known to occur with other diseases? (**Specificity of association.**)
 - 2.4 Is this event explainable by the biological properties of the vaccine? (**Biological plausibility.**)
 - 2.5 Is the vaccination-to-event interval compatible with the event? (**Temporal relation.**)

- 2.6 Has the patient had similar symptoms in the past?
 - 2.7 Is there a history of concomitant or preceding drug therapy?
 - 2.8 Is there a history of a concomitant or preceding condition?
 - 2.9 Are there other factors that could affect the occurrence of the event?
 - 3. **Determine causality category using WHO criteria (see page 1).**
 - 3.1 Is this an unknown event in relation to this vaccine?
 - 3.2 Is this a new event?
 - 3.3 Is there lack of sufficient data to reach a more definite conclusion?
 - 3.4 Would the case benefit from a second review if more data became available?
 - 3.5 Based upon answers to the questions above (in this Section), in which WHO category does the case fit best? N.B. not a numerical score.
 - 4. **Prepare a brief case summary.**
 5. **Take action on recommendation(s) from the review.**
 6. **Consider the case for education purposes.**
 7. **Communicate findings to immunization programme staff, national regulatory authority, and others (as appropriate).**
- D. Systematic causality assessment process for AEFI cluster**
- Define case definition for cluster, verify if cases meet it.
 - Conduct systematic causality assessment as per points 1–7 of section C above, including taking action.
 - Determine if frequency of event is expected, increased, decreased, previously unrecognized or if it is a new event.



Challenges and pitfalls to causality assessment

1. Causality assessment is not done, not systematic, not done by trained personnel and/or not done in a timely fashion.
2. Information in AEFI report is so limited that causality assessment cannot be done.
3. Lack of expertise and/or independence of the review committee responsible for formal causality assessment undermines credibility.
4. Non analysis of the AEFI in context after causality assessment may delay recognition of clusters and possible programme errors.
5. Lack of skilled communication of findings, not addressing all target audiences, or lack of diplomacy and/or cultural sensitivity.

All of these can damage the credibility of the immunization programme by reducing confidence in vaccine safety.

Words of advice

1. Ensure timely review of cases based on the best case information available: solicit additional information on cases soon after receipt when memory is "fresh".
2. Ensure timely triage and referral of serious AEFI for expert systematic causality assessment.
3. Programme expertise is needed for credible quality review, assessment and analysis.
4. Act on recommendations following causality assessment to ensure programme safety and credibility.
5. Feedback and effective communication about the process and the outcomes to stakeholders and the media is vital to avoid misinterpretation.

Assistance for causality assessment is available from the World Health Organization through the Department of Immunization, Vaccines & Biologicals. Additional information on AEFI surveillance, investigation, management and causality assessment, and on vaccine safety communication can be found on the Web at http://www.who.int/immunization_safety/en/

**Department of Immunization,
Vaccines and Biologicals
World Health Organization**

20 Avenue Appia, CH-1211 Geneva 27, Switzerland
Fax: +41 22 791 4210



**WORLD HEALTH
ORGANIZATION**

AEFI Investigation

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

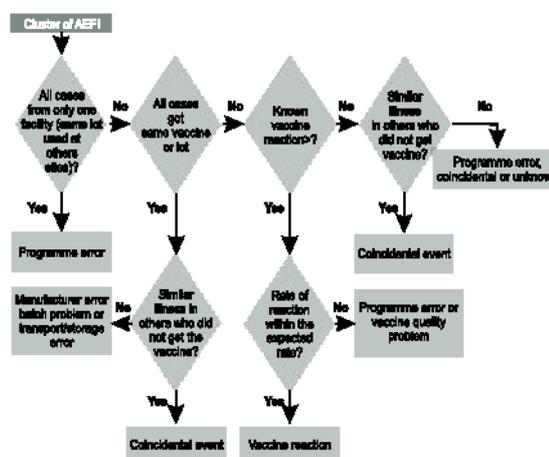
Specificity and strength of association – establish if the same events are being reported in unvaccinated persons and if so, how often and if the cluster is limited to one health center or not

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 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

Vaccine Assessment and Monitoring
 Department of Immunization, Vaccines, and Biologicals
 World Health Organization
 20 avenue Appia, 1211 Geneva 27, Switzerland
 Tel: +41 22 791 4468 Fax: +41 22 791 4210
 Email: immunizationsafety@who.int



**WORLD HEALTH
ORGANIZATION**

Vaccines & Biologicals Aide Mémoire

To ensure the efficiency and safety of mass immunization campaigns with injectable vaccines

Mass immunization campaigns pose specific challenges over routine immunization that national managers and decision-makers must be aware of so as to maximize the benefits and any potential real or perceived negative impact of the campaign. Campaigns represent a substantial financial investment that could be wasted if the necessary coverage is not reached. Campaigns are also a focus of high visibility and scrutiny by the general public and the media. Adverse events that occur during campaigns and the impact of these events must be managed quickly and effectively to encourage good practice and promote public confidence in the programme.

There are substantial challenges in reaching large populations over short periods of time. In order for campaigns to be successful high coverage must be achieved in the total target population, including hard to reach populations. All partners and players at all levels need to be mobilized. There is a definite need to explain and justify the impact of the campaign to all involved parties with respect to optimal disease-specific control and in the wider context of disease prevention and health care.

The aim of mass immunization campaigns is to immunize large populations over a short period of time, which may be beyond the capacity of the existing health infrastructure. Campaigns may be conducted outside the normal health care setting. This necessitates proper and specific planning and very careful supervision. Good planning is essential to campaign success.

With respect to injection safety, the large number of injections to be administered and the large volume of waste generated pose added strains on the system, increasing the probability that breaches in safety may occur. With respect to adverse events following immunization (AEFI), an apparent increase in the number of adverse events may occur. Reasons for this include the large number of doses being given over a short period of time and the administration of vaccine to a wider, usually older, age group.

If not prevented or managed properly, these safety issues can result in the transmission of infection, impaired public and donor confidence in the campaign, and ultimately, reduced coverage and a negative public health impact. However, by considering safety issues from the start of

campaign planning, EPI managers can avoid such problems. Components to ensure safety include: (1) assessing the existing injection safety situation, (2) preparing a detailed campaign plan which addresses key issues identified by the assessment, (3) implementing the plan, and (4) monitoring the results. Managers also need to introduce a simple and timely monitoring system for adverse events for campaigns if this is not already in place. Such a system, in addition to supporting the campaign, provides opportunities for the identification of key immunization and injection safety issues that should be addressed in routine immunization activities and included in a longer-term immunization safety plan.



Checklist

Campaign planning

Is there sufficient evidence of the need for a campaign and of the pertinence of the timing and targeted populations?

- Epidemiological investigation carried out, including a review of immunization data.
- Need for a campaign, timing and targeted populations (age, sex, location) proposed.
- Conclusions endorsed by the national committee.
- Conclusions and plan of operations approved by the national ethical review board as needed.

Have all key players and partners been identified and respective roles and responsibilities clearly assigned?

- Partners listed.
- Roles and responsibilities assigned.
- Roles and responsibilities approved by partners.

Has the Interagency coordinating committee reviewed the plan and budget?

- Plan reviewed.
- Plan to be revised.
- Plan agreed.

Is there evidence that adequate supplies of all necessary items have been planned for and will be delivered on time?

- Supplies listed and quantities estimated.
- Cost estimated.
- Sources of procurement identified, supplies available and estimated date of delivery specified.
- Cold storage and other storage space secured.

- Custom formalities ascertained and exemption obtained, if necessary.

Is there a detailed micro-plan from all local levels targeted including strategies for hard to reach population?

- Geographic area and population defined.
- Micro-plans including delivery strategy available.

Has a plan for social mobilization been developed?

- Communication plan formulated and resourced.
- Communication materials developed (including pre-testing) in consultation with key local and national stakeholders (including community and religious representatives).
- Mechanisms for dissemination of materials in place (print, radio and TV).
- Advocacy meetings with key local religious and community representatives scheduled.

Is there a plan for regular monitoring of the implementation of the campaign including corrective action if necessary?

- Monitoring plan developed with tools (forms) available for monitoring.
- Supervisors identified and trained.
- Supervisory checklists available.
- Plan for regular review of progress and problems encountered available.

Has a plan been developed and resourced for the evaluation of the campaign?

- Monitoring plan developed with tools (forms) available for monitoring.
- Supervisors identified and trained.
- Supervisory checklists available.
- Plan for regular review of progress and problems encountered available.

Has a plan been developed and resourced for the evaluation of the campaign?

- List of process and outcome indicators to be measured at each level available.
- Plan for disseminating results to all key players exists.

Is there a sufficient number of Qualified vaccinators and support staff (including volunteers) to meet the campaign objectives?

- Number of staff available is adequate to meet campaign objectives.
- Adequate numbers of Qualified with workers and support staff (including volunteers) are available.
- Sufficient number of supervisors available to provide supportive supervision of all teams effectively.

Has the availability of transport for supervision, social mobilization activities, vaccine and injection material been verified?

- Sufficient number of vehicles available for transport for planned activities in area of supervision and social mobilization and for vaccine and injection material distribution.

- Sufficient funds available for transport costs.

Have supervisory visits been made to all provinces/first level administrative subdivisions to review plans and preparedness?

- Visit reports available from each province/first level administrative subdivision indicating that campaign preparations are satisfactory, or including recommendations for revisions to plans.

Safe and efficient vaccine administration

Will only WHO/UNICEF pre-qualified vaccine or vaccine and injection material approved by national regulatory authorities be used?

- List of vaccines and injection materials with procurement source identified.
- All vaccines listed pre-qualified or approved by national regulatory authorities.

Is vaccine bundled with reconstitution syringes, auto-disable syringes and sharps boxes as per the terms of the joint WHO/UNICEF/UNFPA statement on injection safety?

- List of quantities of vaccine, reconstitution syringes, auto-disable syringes and sharps boxes.

Have responsible staff been clearly informed of the importance of sending correct and matching quantities of diluents with freeze-dried vaccines?

- Clear information given to responsible staff with respect to the sending of correct and matching quantities of diluents with freeze-dried vaccines.

Have all health care workers been trained in proper vaccine administration techniques with an emphasis on the need for sterile technique, correct reconstitution and safe immunization injection practices, and on the need to comply with proper cold chain procedures?

- Training curriculum identified with written training material prepared.
- Training completed.
- Number of health workers who completed the course and number of absentees.

Have staff been clearly instructed not to recap syringes?

- Clear instructions given to staff not to recap syringes. Have staff been clearly instructed to discard all reconstituted vaccines within six hours or at the end of the immunization session, whichever comes first?
- Clear instructions given to staff to discard reconstituted vaccines within six hours or at the end of the immunization session, whichever comes first.

Is vaccine distribution appropriately tracked by lot?

- Vaccine distribution forms include lot number and amount of vaccine and diluents distribution to all levels.

Have the logistics been carefully planned to ensure availability of all supplies at all vaccination posts?

- List of supplies (including quantities) to be delivered to each post available.
- Distribution plan for supplies available.

Have vaccine and injection material storage sites been identified?

- List of storage sites and capacity of each site.
- Required storage capacity identified.

Has the capacity to freeze sufficient ice packs been ensured?

- List of sites for freezing and capacity of each site.
- Sufficient freezing capacity is available.

Is there a sufficient number of vaccine-carriers for all teams?

- Number of vaccine carriers available known.

Has the need for vaccination cards been assessed?

If vaccination cards necessary:

- Number of vaccination cards needed and available known.
- Vaccination cards include information on vaccine lot number to enable tracking.
- Training provided on accurate use of vaccination cards.

Sharps waste management

Have local regulations and possibilities for sharps treatment and disposal been assessed?

- Local regulations identified.
- Possibilities for sharps treatment and disposal assessed (functioning incinerators, sites for burning, etc.).
- Most appropriate option for treatment and disposal identified.

Have practical, simple solutions for waste collection and disposal been identified?

- Waste disposal system used for routine immunization programme identified.
- Plan for waste collection and disposal developed.

Have equipment, places and facilities been identified for sharps waste disposal?

- List of equipment, places and facilities for sharps waste disposal identified.

Has the availability of adequate safety boxes, sharps waste disposal facilities, etc., been ensured?

- Quantities of required supplies determined.
- Sufficient quantities of all supplies currently available.
- Sufficient supplies have been ordered and there is an appropriate estimated delivery date.

Have clear instructions and guidelines for health staff on safe waste disposal (assembly, use, collection and disposal of safety boxes) been provided?

- Training and has been provided for health staff.
- Written guidelines for safe waste disposal available.

Will disposal be monitored on a daily basis?

- Responsible person identified to monitor waste disposal on a daily basis.

AEFI management and monitoring

Is there an AEFI monitoring systems in place?

- Responsible focal point for AEFI monitoring identified.
- Clear guidelines exist on what to report, how to report and what to investigate.

Are rapid reporting channels for AEFI and vaccine safety issues in place?

- Reporting channels clearly stated.
- Method of reporting known.

Has a decision been made on which AEFI should be reported and which contraindications should be observed?

- List of AEFI to be reported available.
- List of contraindications to be observed available.

Has an AEFI review committee been formed and the structure and capacity to rapidly respond to and investigate serious AEFI been planned?

- Membership of review committee documented.
- Training incorporates information on potential adverse events.

Have health care workers been trained on how to investigate and manage AEFIs and respond to rumours?

- How to investigate and manage AEFI included in training.
- Focal points identified to deal with rumours.

Ordering code: WHO/V&B/02.10

This document is available on the Internet at: <http://www.who.int/vaccines-documents>

Additional information on immunization safety can be obtained on the Internet at <http://www.who.int/vaccines>

Immunization Safety Priority Project
Department of Vaccines and Biologicals
World Health Organization
20 Avenue Appia, CH-1211 Geneva 27, Switzerland
Fax: +41 22 791 4210; Email: spidata@who.int

World Health Organization, 20 Avenue Appia, CH-1211 Geneva 27, Switzerland
www.who.int/vaccines



Communication and Media Management

Qualities of a good spokesperson

A good spokesperson can prevent an AEFI event from turning into a crisis. The spokesperson should be a good communicator who is trusted and is able to speak with authority. S/he may not necessarily be a medical expert, but must have competent knowledge of the immunization programme. When communicating about AEFI it is important for the spokesperson to remember that trust is a key component of the exchange of information at every level. Talking about risk estimates that are later shown to be incorrect may breakdown this trust. The spokesperson should avoid making premature statements about the cause of the event before the investigation is complete. If the cause is identified as programme error, do not lay personal blame on anyone. Instead, talk about system-related problems which resulted in the programme error(s) and mention steps being taken to correct the problem. A spokesperson should:

- Be available and be fully prepared – always – to comment when a communication is sent out to the media. [See Box....."What to do when caught unprepared by a reporter?"]
- Know, and fully understand, why you want to talk to a reporter and why the reporter may want to talk to you.
- Ask the reporter for specific questions or issues so that you are prepared well to answer.
- Know and practise what you want to say in one minute or less.
- Cite tangible evidence during interview to back up your key points – data/research/ statistics/anecdote. Carry this data in a written format or fax later. The reporter is likely to cite your data – and cite it accurately!
- Avoid defensive comments. Be proactive, *not reactive*, while arguing your case.
- If you don't know an answer, tell the reporter when you can get back with the information – and do get back! Or, give the reporter a contact who knows the answer. This way you communicate to be cooperative and a reliable source.
- Anticipate questions and prepare answers in advance. Rehearse well.
- Know the top 1-3 clear, concise messages. Make positive statements.
- Avoid acronyms, jargon and technical terms – remember the public.
- Use the AEFI Committee's name, use "we" referring to immunization team, but never "I".
- Show true interest in your subject, believe in what you are addressing, and demonstrate that you are entirely convinced about the statements you are communicating. This is the only way to get the reporter interested and to persuade the reporter – and public – to support your position.

What to do when caught unprepared by a reporter

1. Find out the reporter's objective. If possible ask for specific questions, or request the reporter to email/fax you a set of questions.
2. Ask for time, at least some time. Even 15 minutes can help you get access to data, or call other people or an expert for information, etc. Most reporters oblige. ??Determine the reporter's deadline and get back by that time.
3. If you decide not to do an interview, let the reporter know and help, if possible, to find an alternative interviewee.
4. Be aware that the reporter probably already has a story focus and you may eventually be quoted just a few words. Irrespective of that, it is about building relationships and at no time it is more important than during an AEFI when you need every individual's support.
5. Be appreciative and helpful when reporters call.

What the public expects to hear during an AEFI

1. Genuine concern. It is better to provide the true estimate, and use words that make it sound that the damage is actually less serious than one thought. The public is reassured by such a thought.
2. Tell people what to expect. If there are possibilities of future negative outcomes, let people know.
3. Offer only what you know. Acknowledge uncertainty. If a question cannot be answered, it is best to say that the answer at that moment was not available, and that all efforts were being made to find out the missing answers. Emphasize that a process is in place to learn more. Describe the process in simple terms.

-
4. Be regretful, not defensive. Say, "We are sorry ..." or "We feel terrible that ...". Don't use "We regret," which sounds very formal as if you're preparing for a lawsuit.
 5. Acknowledge the public's fears. Don't tell people they shouldn't be afraid. They are afraid and they have a right to their fears. It is a question of their children's lives, after all.
 6. Use "We wish..." if you are yet to receive answers to ongoing investigations. Say, "We wish we knew more at this moment." Public will find you sincere.
 7. Ensure public does not hear mixed messages. Mixed messages create panic. Panic doesn't come from bad news, but from mixed messages. Close all avenues from where conflicting messages might be emerging. Give the public one credible source for information, which they can turn to for help.
 8. Answer the "what if" questions if they are asked (though it is impractical to fuel them yourself). The public will have apprehensions and is looking for expert answers. People need to be emotionally prepared if matters are expected to worsen. But remember that your answer to the what-if questions describes actions being taken to arrest the situation from worsening.
 9. Give people things to do. People often participate collectively in an emergency situation. Even individual actions are taken. Simple actions in an emergency will give people a sense of control.
 10. Ask people to bear the risk and work toward solutions with you. If you acknowledge the risk's severity and complexity, and recognize people's fears, you can then ask the best of them.

For field workers

Communication with community and caregivers

In communicating with the community, it is useful to develop links with community leaders and the peripheral health workers so that information can be rapidly disseminated. Field workers need to be supported and provided with appropriate information to respond directly to community concerns. When there is a high level of concern about a vaccine, communication with the community can emphasize the known benefits of immunization in preventing serious diseases compared to the uncertainty over whether the adverse event(s) are truly caused by the vaccine (presenting data on disease risks versus risks of vaccine reactions and vaccine effectiveness may be useful). When communicating with caregivers during an AEFI, it will be useful to:

- Listen patiently and sympathetically to caregivers and their concerns.
- Reassure and support the caregiver or patient but not make false promises.
- Assist the caregiver with taking the patient to PHC/hospital facility in case of an AEFI.
- Keep the parent/guardian routinely informed of the progress of the patient.

Conducting Autopsies - Important Considerations

Sampling for histopathology examination

(To be sent to pathologist for underlying disease/pathologies in the deceased which may be the cause of death or contributed in the cause of death)

The samples should be representative of the suspicious area of disease/pathology however in general

- 80 to 100 gms of liver,
- 80 to 100 gms of brain with meninges,
- Fragments from both adrenal glands
- Half of transverse section of kidneys,
- Half of Spleen
- Whole heart

All The visceral specimens should be collected in separate container a wide- mouthed bottle as prescribed and 10 percent formalin should be added as preservatives. The quantitative of the formalin should be sufficient to cover all the pieces of specimen viscera in bottle.

The specimens should be sealed, signed, labeled by the doctor/autopsy surgeon and should be handed over to police / investigating officer for further pathological examination.

Sampling for toxicological screening

(To be sent to forensic laboratory for toxicological/chemical examination)

1. Site of Injection –

The underneath tissues up to 2-3 cms (button size) with dermis and epidermis of the sight of injection prick should be excised out.

It should be preserved in a glass jar which should be filled 2/3 with saturated saline water.

The specimens should be sealed, signed, labeled by the doctor/autopsy surgeon and should be handed over to police / investigating officer for further toxicological/chemical examination.

2. Viscera for toxicological/chemical examination

The following viscera specimen/biological samples should be collected for toxicological/chemical examination for the establishment of cause of death

- 80 to 100 gms of liver,
- 80 to 100 gms of brain with meninges,
- Whole of the stomach with gastric contents. If there are no gastric contents, a section of stomach should be sent.
- The upper part of small intestine about 30cm long with its contents.
- Fragments from both adrenal glands
- Half of transverse section of kidneys,
- Half of Spleen
- Blood 100 ml ideal / minimum 10 ml.
- Urine 100 ml/ minimum 10 ml.

All The visceral specimens should be collected in separate container a wide- mouthed bottle as prescribed and saturated saline should be added as preservatives. The quantitative of the saline should be sufficient to cover all the pieces of specimen viscera in bottle.

The specimens should be sealed, signed, labeled by the doctor/autopsy surgeon and should be handed over to police / investigating officer for further chemical examination in a forensic lab.

Ideal containers for viscera

- For preservation of viscera, clean, wide mouthed glass bottles fitted with glass stoppers of one liter capacity should be used. Rubber inserts should preferably not be used under caps.
- 20-30 ml of Blood (taken from femoral artery or vein by per skin puncture) should be collected in 30 ml screw-capped bottles or in plastic capped tubes
- 20-30 ml of Urine is obtained from direct puncture of the bladder with a syringe and needle and should be collected in 30 ml screw-capped bottles or in plastic capped tubes

Ideal preservative for viscera

- Saturated sodium chloride solution (common salt.) for all the visceral samples for chemical/toxicological examination
- 10 mg of sodium or potassium fluoride per ml of blood should be added in blood for preserving blood.
- 20-30 ml of Urine is obtained from directly puncture of the bladder with a syringe and needle and preservative 20-30mg of thymol blue or boric acid or acetic acid should be added as preservative.
- If there is an associated history of death due to acid intoxication then all the samples should be preserved in rectified spirit.

Reporting of Autopsy report/forensic/pathology results

- The approved accredited reference government laboratories should forward a copy of the further laboratorial results to the concerned CMO/ DIO for further necessary action/conclusion.
- The district / corporation should ensure that a copy of the autopsy report is shared with State and National AEFI committee.
- In case of any delay the district and state AEFI committee must follow up and ensure that a copy of the results is received.

Checklist for program/ district managers

Tick (✓) each task as it is done:

Be prepared (Steps to take before an event occurs)

- Read the document: " Operational Guidelines on Surveillance and Response to AEFI – 2010" and the SOP
- Understand a standard case definition for AEFI and standard investigation procedures.
- Designate and train staff to conduct an AEFI investigation using the investigation form.
- Train staff on how to collect specimens.
- Inform all health workers/clinicians of the need to immediately report an AEFI which meets the case definition.
- Identify a spokesperson for public communications.

Receiving a report

- Decide if the report is a genuine AEFI according to the definition, and whether it needs investigating and/or announcing to the public. (Consult with Immunization programme managers at the next level of the health system if necessary).
- Arrange to travel to the location of the AEFI, or delegate responsibility to another trained person or team to do this.

Investigate and collect data

- Ask about the vaccine.
- Ask about immunization services.
- Ask about the patient.
- Observe the service in action.
- Observe the storage procedures for vaccines and diluents in the relevant location(s) (health unit refrigerator, district store etc.); are other drugs stored with the vaccine or diluent that may have mistakenly been used?
- Take an inventory of drugs/chemicals in storage at the location.
- Formulate a hypothesis as to the cause of the AEFI.
- From the patient (urine, blood, tissue specimens as appropriate); Implicated vial(s) of the vaccine; and the syringes and needles. Note: most paralyzing agents implicated are excreted in the urine.

Dispatch specimens

- Know where and how to dispatch specimens for testing.

Analyze the data

- Obtain laboratory results.
- Review clinical findings.
- Review on-site investigation.
- Review epidemiological findings e.g. clustering of cases in time or space or by vaccine manufacturer or lot.
- Summarize and report findings.
- Consult WHO or other experts for assistance when needed.

Take action

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

List of Key Contacts

For what activity	Name and address	Contact Details
Reporting AEFI by sending FIR, PIR and DIRs	Assistant Commissioner (Immunization), Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi-110011	Tel: 011- 23062126 Fax: 011-23062728, 23062126 Email: aefiindia@gmail.com
For Shipment of vaccines and diluents	Head, Central Drugs Laboratory, Central Research Institute, Kasauli – 173 204. Himachal Pradesh.	Tel: 0179-2272046, 2272060 Fax: 0179-2272049, 2272016 Email: nclkasaul@gmail.com
For Shipment of syringes, needles and vitamin A	The Director, Central Drug Laboratory, Min. of Health & Family Welfare, Govt. of India, 3, Kyd Street, Kolkata- 700016	Tel: 033- 22299541 Fax - 033-222 99380, 033- 222 98336 Email: cdllkol@gmail.com
Biological specimens for JE Vaccine	The Director, National Institute of Virology (NIV) (JE Group), MCC 130/1, Sus Road, Pashan, Pune-411021	Tel: 020-26006390, 020-26127301, 020-26006290; Fax: 020-25871895, 020-26122669, 020-26126399 Email: nivict@pn3.vsnl.net.in, acm1750@rediffmail.com (www.niv.co.in)
	Officer In Charge NIV, Gorakhpur Unit BRD Medical College Campus Gorakhpur-273013	Tel: 0551-2506698 Fax: 0551-2506698 Email: goremilind@gmail.com

Further Reading

Useful web resources and references on AEFI surveillance and vaccine safety :

World Health Organization links:

- WHO web site link related to Immunization Safety: http://www.who.int/immunization_safety/publications/aeft/en/.
- Specific WHO web pages related to vaccine safety/AEFI: http://www.who.int/immunization_safety/aeft/en/
- Vaccine Safety Net page - http://www.who.int/immunization_safety/safety_quality/vaccine_safety_websites/en/
- Global Advisory Committee on Vaccine Safety (GACVS) webpage: http://www.who.int/vaccine_safety/en/

Other links:

- Brighton Collaboration Webpage - <http://www.brightoncollaboration.org>

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