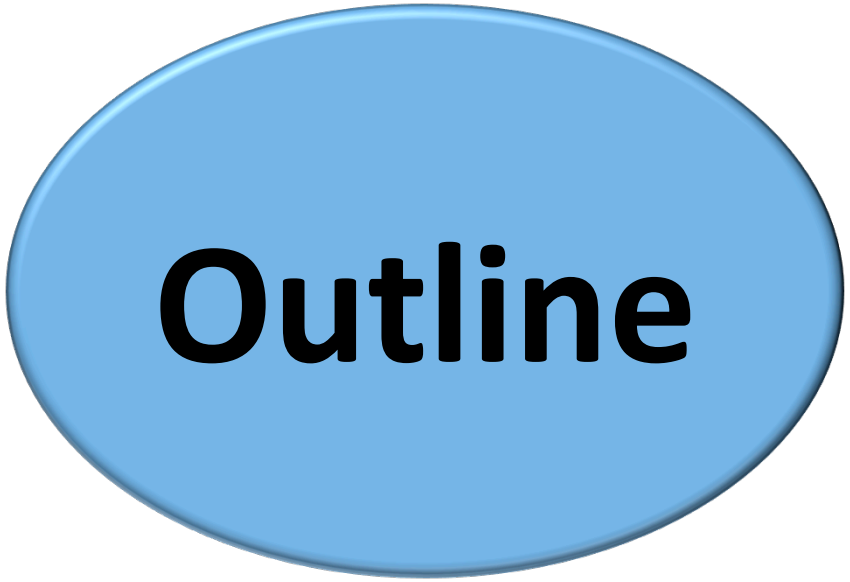
Adverse Event Following Immunization (AEFI)

- Type of AEFI
- Organisations and AEFI committees at different levels and their roles
- Processes involved
- Links with National Regulatory Authority



What is AEFI?

- **An adverse event following immunization (AEFI) is any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine**
  - The adverse event may be any unfavorable or unintended sign, abnormal laboratory finding, symptom or disease

AEFIs are categorized according to their cause

- Vaccine Product related
- Immunization error related
- Coincidental
- Vaccine quality defect related
- Immunization anxiety related

Cause–specific categorization of AEFI (CIOMS/WHO 2012)

Vaccine Product related

An AEFI that is caused or precipitated by a vaccine due to one or more of the inherent properties of the vaccine product.

- Individual's response to the inherent property of the vaccine,
- Even when the vaccine has been prepared, handled and administered correctly.
- May be due to an immune-mediated reaction of the individual or replication of the vaccine-associated microbial agent.
- Usually mild in nature. For example: Fever.

Cause–specific categorization of AEFI (CIOMS/WHO 2012)

Vaccine quality defect-related

An AEFI that is caused or precipitated by a vaccine that is due to one or more quality defects of the vaccine product, including its administration device as provided by the manufacturer.

- Is the defect in a vaccine, that occurred during the manufacturing process.
- May have an impact on a individual's response
- Example: Insufficient inactivation of a wild type vaccine agent (Polio)
- Incidents have become negligible due
  - Introduction of good manufacturing process (GMPs).
  - Strengthening the National Regulatory Authorities.

Cause–specific categorization of AEFI (CIOMS/WHO 2012)

Immunization error related

An AEFI that is caused by inappropriate vaccine handling, prescribing or administration and thus by its nature is preventable.

- Refers to errors related to all processes that occur after a vaccine product has left the manufacturing / package site − handling, prescribing and administration of the vaccine.
- Example: Local tenderness, systemic / local reactions, anaphylaxis, neurologic, muscular, vascular or bony injury due to incorrect site / equipment / technique, Sterile abscess

Cause–specific categorization of AEFI (CIOMS/WHO 2012)

Immunization anxiety-related

An AEFI arising from anxiety about the immunization.

- Individual and groups can become stressed and react to fear or pain of injection.
- Reaction is unrelated to the content of the vaccine.
- Example: Fainting, lightheadedness, vomiting, dizziness, tingling around mouth & in the hands.
- Common in mass vaccination campaigns

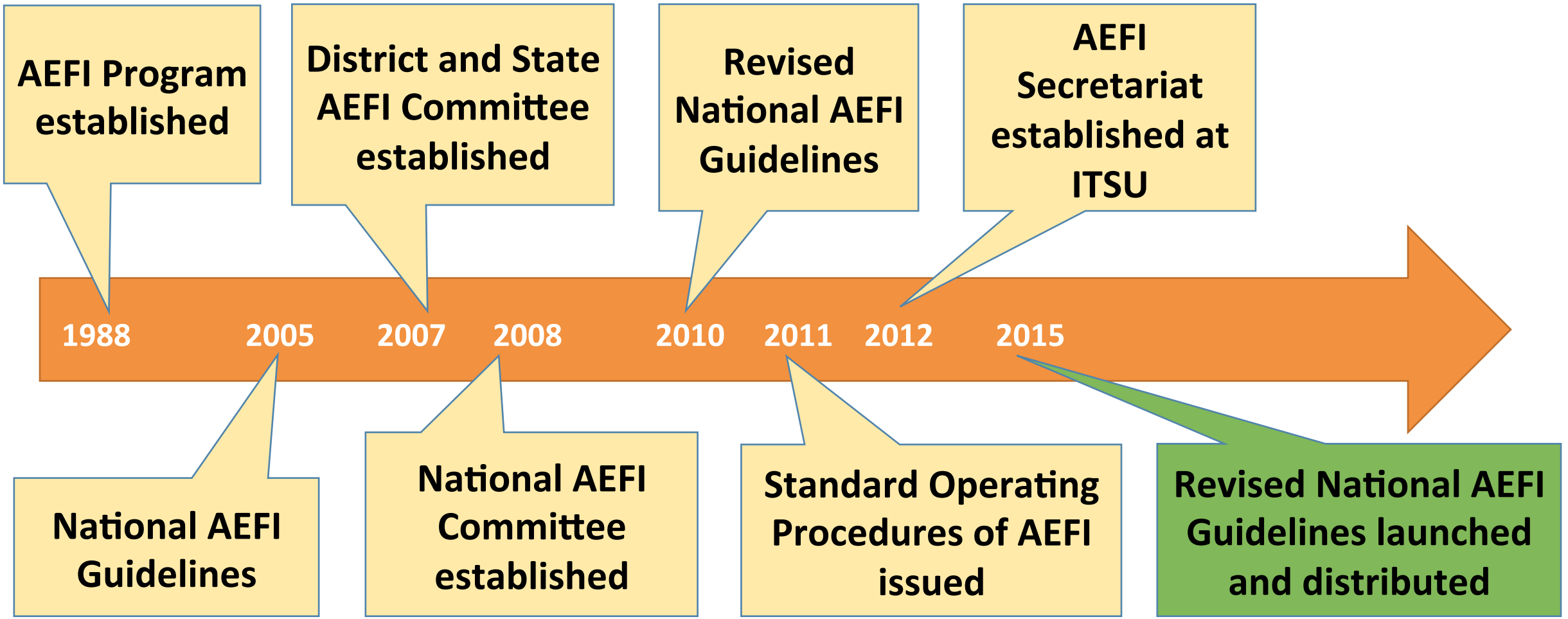
Cause–specific categorization of AEFI (CIOMS/WHO 2012)

Coincidental event

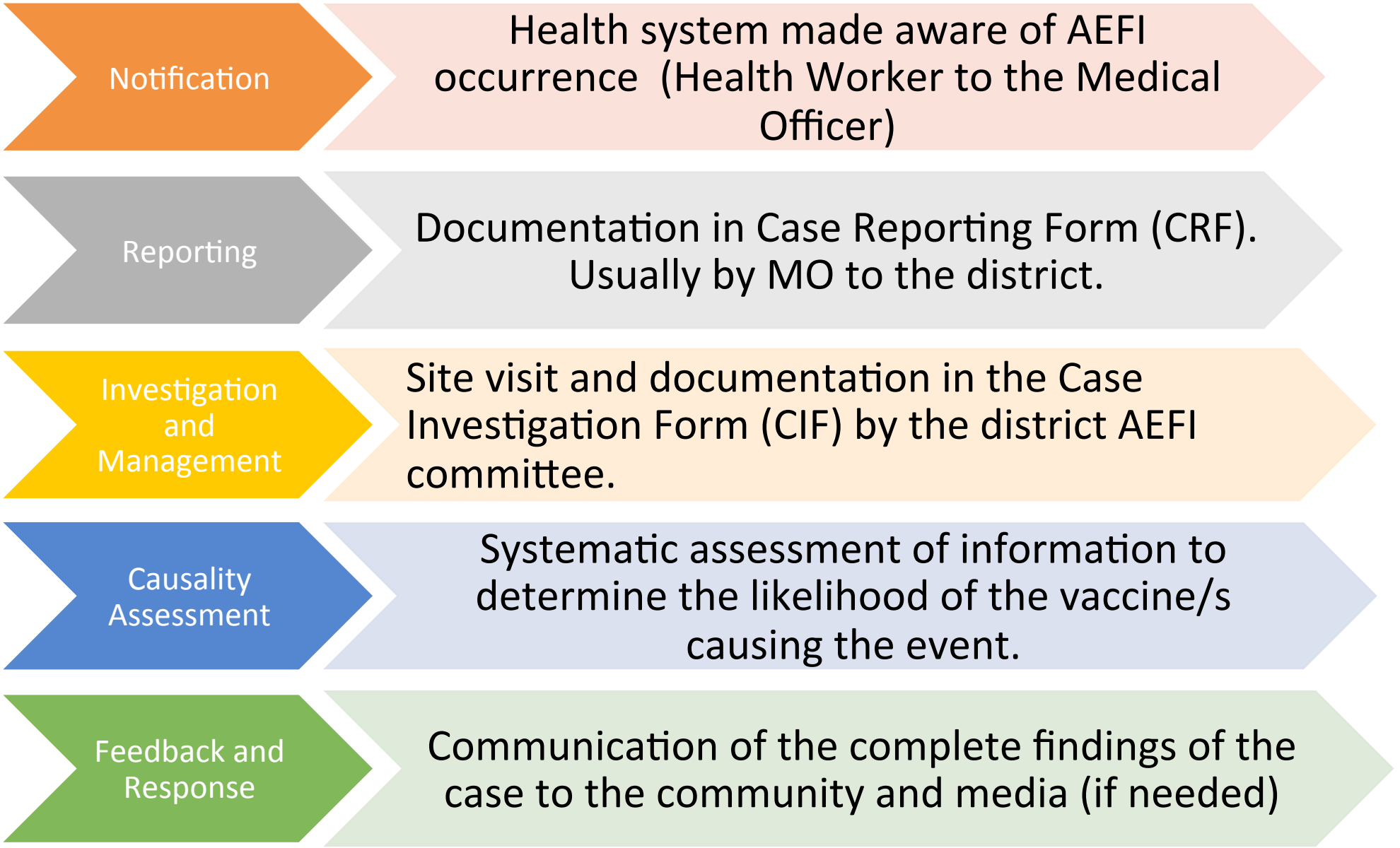
An AEFI that is caused by something other than the vaccine product, immunization error or immunization anxiety.

- An event may occur coincidentally with immunization and at times may be falsely attributed to be a result of the administered vaccine.
- Vaccine are normally administered early in life when infections / other illnesses are common.
- Possible to encounter many events / death, which can be falsely attributed to vaccine through chance association.

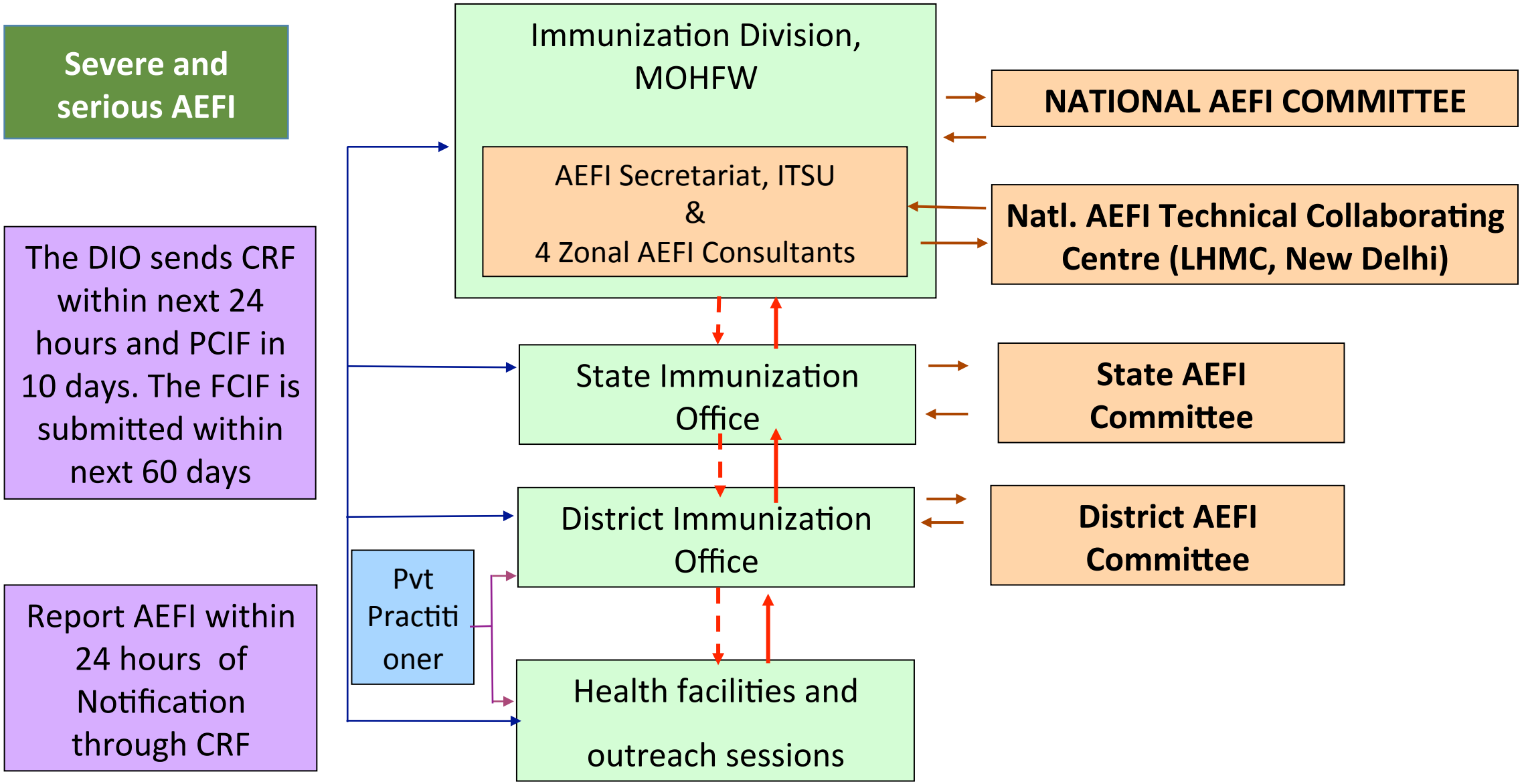
Milestones in AEFI Program implementation in India



Components of AEFI Surveillance



AEFI Organizational Structure



AEFI COMMITTEES : Roles and Responsibilities

Composition

- Epidemiologist/Public Health Specialist
- Representative from Drug Authority
- **Pediatrician,** Microbiologist, Neurologist
- Pathologist, Forensic Expert, Cold Chain officer
- Member, Integrated Disease Surveillance Project (IDSP) officer
- Representative from local bodies like corporations
- **Representatives from professional bodies like IAP,IMA**
- Representatives from partners agencies
- ***Member Secretary*** : Imm. Program Manager

Terms of reference
(National/ State/District)

- Strengthen and validate AEFI reporting at all levels
- Ensure implementation of uniform standards and formats.
- Prompt & thorough investigation of serious AEFIs and periodic review of non serious AEFIs
- Timely classification of cases
- Causality assessment (*Brighton Classification*)
- Support spokesperson for media interface and management.

Vaccine reactions

MINOR REACTIONS

- Usually occur within a few hours of injection.
- Resolve after short period of time and pose little danger.
- Local (includes pain, swelling or redness at the site of injection).
- Systemic (includes fever, malaise, muscle pain, headache or loss of appetite).

MINOR REACTIONS

Vaccine	Local reactions	Systemic reactions	
	(pain, swelling, redness)	Fever > 38°C	Irritability, malaise and systemic symptoms
BCG	90% – 95%	–	–
Hepatitis B	Adults up to 15%, Children up to 5%	1 – 6%	–
Hib	5 – 15%	2% – 10%	
Measles/MR	~ 10%	5% – 15%	5% (Rash)
OPV	None	Less than 1%	Less than 1%
Pertussis (DTwP)	up to 50%	up to 50%	up to 55%
Pnemucoccal conjugate[5]	~ 20%	~ 20%	~ 20%
Tetanus	~ 10%[4]	~ 10%	~ 25
Treatment	• Cold cloth at injection site • Paracetamol	• Give extra oral fluids • Wear cool clothing • Tepid sponge or bath • Paracetamol	• Give extra oral fluids • Paracetamol

Vaccine reactions

MINOR REACTIONS | SEVERE REACTIONS

Vaccine	Reaction*	Onset interval	Frequency per doses given
BCG	Fatal dissemination of BCG infection	1 – 12 months	0.19 – 1.56/1.000.000
OPV	Vaccine associated paralytic poliomyelitis (VAPP)**	4 – 30 days	2 – 4/1.000.000
DTwP	Prolonged crying and seizures***	0 – 24 hours	< 1/100
	HHE	0 – 24 hours	< 1/1.000 – 2/1.000
Measles	Febrile seizures	6 – 12 days	1/3.000
	Thrombocytopenia	15 – 35 days	1/30.000
	Anaphylaxis	1 hour	1/100.000

* Reactions (except anaphylaxis) do not occur if already immune (90% of those receiving a second dose); children >6 years unlikely to have febrile seizures.
** VAPP risk higher for first dose (1 in 750 000 compared with 1 in 5.1 million for subsequent doses), and for adults and immunocompromised clients.
*** Seizures are mostly febrile. The risk of having a seizure depends on the persons age. The risk is much lower in infants <4 months of age.

Difference between serious and severe reactions

Severe reactions
(Not regulatory term)

- Can be disabling and rarely, life threatening.
- Must be reported.
- Most do not lead to long-term problems.
- Severe reactions include serious reactions

Serious reactions
(Regulatory term)

Results in death.

Requires inpatient hospitalization.

Results in persistent or significant disability.

Is life-threatening.

What to report and how?

Immediate Direct reporting:

- **Serious AEFIs**
  - Death
  - Hospitalization
  - Cluster
  - Disability
- **Severe AEFIs eg**
  - Injection site swelling beyond nearest joint
  - Fever >102 degrees

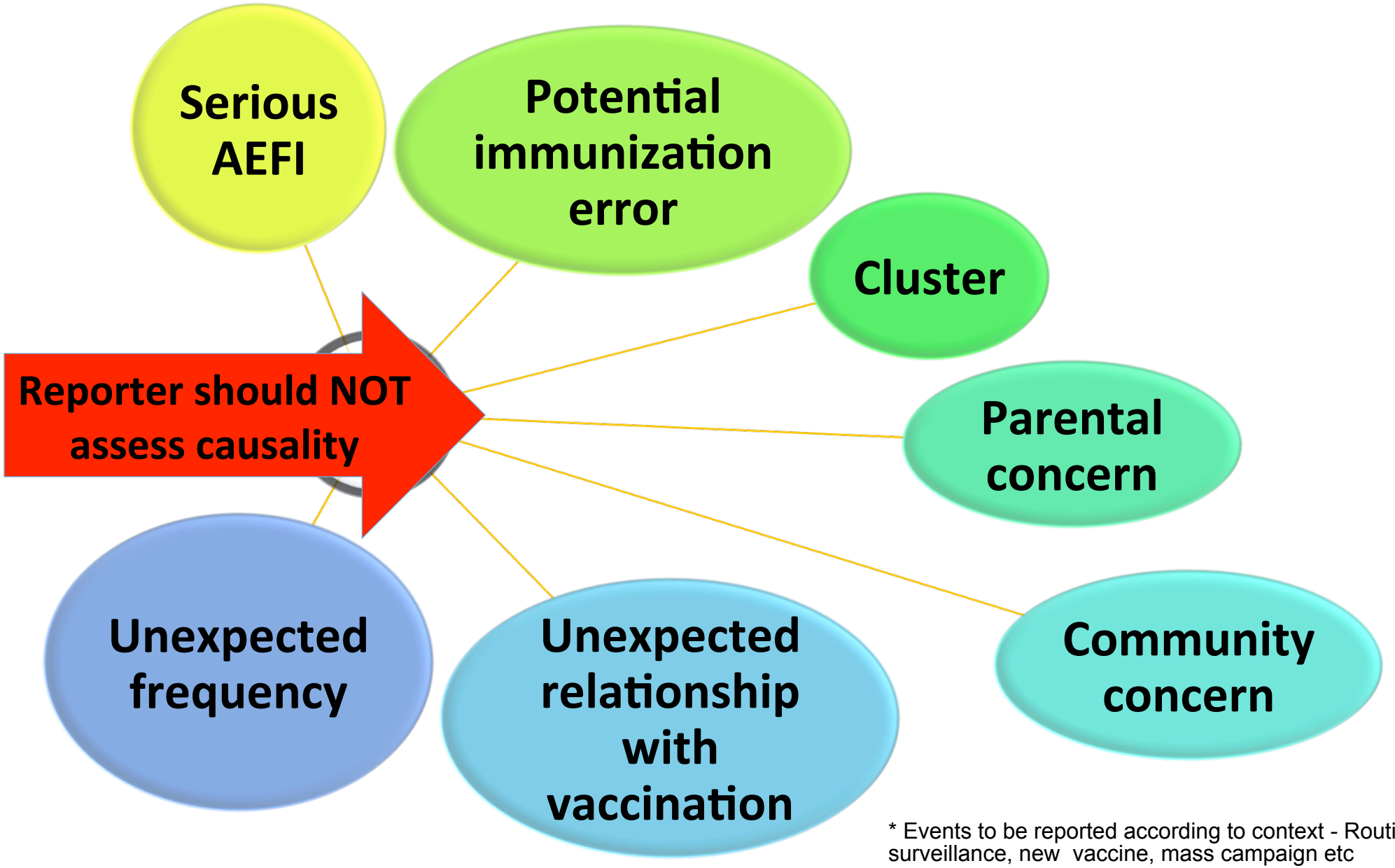
New

Monthly routine reporting in HMIS*

- **Death**----(selected Serious AEFI)
- **Abscess**---(selected non serious AEFI)
- **Others**----All other serious and non serious AEFIs are reported in this category

HMIS-Health Management Information System

AEFI Case selection for Reporting*



* Events to be reported according to context - Routine surveillance, new vaccine, mass campaign etc

Investigating AEFIs

- Confirm the reported diagnosis of AEFI and collect the details and outcome
- Determine whether unimmunized persons are experiencing the same medical event(s)
- Investigate the link between the vaccine given and the AEFI
- Determine the contribution of operational aspects of the program to the reported AEFI
- Determine whether a reported event was isolated or part of a cluster
- Determine the cause of the AEFI and take further actions deemed necessary.
- Identify system problems rather than finding individuals to blame.

Causality Assessment

- **Causality assessment** is the systematic evaluation of the information obtained about an adverse event following an immunization to determine the likelihood that the event might have been caused by the vaccine/s received.

Causality and Causality assessment

Causality*

- Is the relationship between two events (the cause and the effect), where the second event is a consequence of the first

Causality Assessment

- Determining if such a relationship exists and if so to what extent

*A direct cause is a factor in absence of which the effect would not occur (necessary cause).
*Sometimes, there are multiple factors that can precipitate or function as co-factors for the effect (event) to occur.

Key stakeholders

- Drug Controller General of India (DCGI)
  - Central Drug Standard Control Organization (CDSCO)
  - Pharmacovigilance Programme of India (PvPI)
- Indian Academy of Paediatrics (IAP),
- Child Health Foundation (CHF),
- Indian Medical Association (IMA),
- Trained Nurses Association of India (TNAI)

Coordination with NRA

- Guidance for Industry: Pharmacovigilance Requirements for Biological Products includes guidelines to vaccine manufacturers to contribute to vaccine pharmacovigilance and information about AEFI surveillance guidelines (processes and structures).

http://www.cdsco.nic.in/writereaddata/Pharmacovigilance_guidance_Final.pdf

- Immunization Division (MOHFW) shares vaccine details of reported serious AEFIs every week to CDSCO and PvPI (Pharmacovigilance Programme of India)
- Contributing data to support Periodic Safety Update Report reviews and Signal Reviews
- Sharing of details of reported serious /severe cases from Adverse Drug Reaction Monitoring Centres by PvPI to district, state immunization officers for detailed case investigations
- Joint investigations (Immunization Division, state and CDSCO) in special circumstances (cluster deaths/ hospitalizations, community concern, etc.)
- Support to state and district immunization officers in the form of Immunization Safety and Pharmacovigilance Associates for AEFI reporting and investigations

Summary

- The MOHFW is committed to improve AEFI surveillance to ensure public confidence in vaccine safety through development of institutional mechanisms
- Investments made to strengthen AEFI surveillance is showing results but there is still a long way to go
- Interdisciplinary coordination amongst programme personnel, academia, professional bodies, private practitioners, pharmacovigilance partners and others at all levels is key to improved AEFI surveillance
- The future lies in improved coordination between AEFI, Pharmacovigilance Programme of India and Central Drugs Standards and Control Organisation to integrate surveillance with regulatory functions

Immunization Waste Management

Immunization Waste Management

- Unsafe disposal of immunization waste is dangerous
  - Dangers to health:
    - acquiring infection (particularly, needle-stick injury to children, rag pickers and animals)
    - Recycling
  - Dangers to environment:
    - From sharps
    - From burning

- Not permitted by Central Pollution control Board (CPCB)

Steps to ensure safe disposal of immunization waste

The CPCB outlines the following Guidelines for disposal of biomedical waste generated during immunization under UIP:

The concerned CMO of the respective area:

- will obtain authorization from the "Prescribed Authority" notified under the Bio-medical Waste (Management & Handling) Rules (i.e. from **State Pollution Control Board/ Committee**)
- for generating, collecting, receiving, storing, transporting, treating, disposing and/or handling bio-medical waste in any other manner

Steps to ensure safe disposal of immunization waste

Disposal of bio-medical waste generated at Outreach Points/PHCs/ CHCs/ DHs etc.

Step 1: At the session site,

- Use the hub-cutter to cut the AD syringe **at its hub** immediately after administering the vaccine injection
- The needle will get stored in the puncture-proof translucent container of the hub-cutter

Step 2:

- Store the **broken vials in a separate white**, translucent, sturdy and **puncture-proof** container, or in the same hub-cutter (in case its capacity is also able to accommodate broken vials)

Steps to ensure safe disposal of immunization waste

Disposal of bio-medical waste generated at Outreach Points/PHCs/ CHCs/ DHs etc.

Step 3:

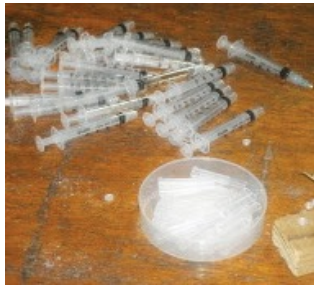
- Segregate and store the plastic portion of the cut syringes in the re bag or container
- Both the bag and the container should bear the biohazard symbol (stipulated in the Schedule III of the BMW Rules)

Steps to ensure safe disposal of immunization waste

Waste from Immunization Session

- Cut hub of AD and Disposable syringes
- Broken vials and ampoules

- Plastic part of Syninges



- Needle Caps
- Wrappers

Steps to ensure safe disposal of immunization waste

Disposal of bio-medical waste generated at Outreach Points/PHCs/ CHCs/ DHs etc

Step 4: Send the collected materials to the Common Biomedical Waste Treatment Facilities (CBWTF) of the hospital

- If the CBWTF doesn't exist then, go to **Step 5**

Step 5: Treat the collected material

- **in an autoclave**
  - If it is unable to impart autoclaving:
    - boil the waste in water for at least 10 minutes, or
    - **provide chemical treatment (using at least 1% solution of sodium hypochlorite for 30 minutes)**
    - Ensure that these treatments result in disinfection

Steps to ensure safe disposal of immunization waste

Disposal of bio-medical waste generated at Outreach Points/PHCs/ CHCs/ DHs etc.

- **Step 6:** Dispose the autoclaved (or boiled/chemically disinfected) waste as follows:
  - Dispose the **needles and broken vials** in a safety pit / tank
  - Send the **syringes and unbroken vials** for recycling or landfill

- **Step 7:** Wash the containers properly for re-use

Steps to ensure safe disposal of immunization waste

Send to Health Facility at end of Session

Disinfect in 1% Hypochlorite Solution (for 30 minutes)

Disinfect 1% Hypochlorite Solution (for 30 minutes)

Dispose in Safety Pit

Recycle

Dispose as Municipal Waste

Safe Disposal Pit / Tank

- Used to dispose off treated needles & broken vials (sharps)

Summary

- Immunization waste disposal is a key function of the VCCH
- Collection of segregated waste, disinfection and disposal of immunization waste should be done as per CPCB norms
- Ensure availability and distribution of red and black bags and hub cutters for the sessions
- Twin bucket and freshly prepared hypochlorite solution should be available at the CCP