# Individual Case Safety Report (ICSR) Workflow Simulation Project

## 1. Introduction

This mini-project demonstrates a simulated pharmacovigilance workflow for Individual Case Safety Reports (ICSRs) based on publicly available data. The purpose is to understand how ADR case data is received, processed, reviewed, and reported according to pharmacovigilance standards.

## 2. Data Source

The data for this simulation was derived from open databases such as Openvigil, WHO VigiAccess and FDA FAERS. For demonstration purposes, data related to Amoxicillin-Clavulanic Acid and Ibuprofen were selected, as these drugs are frequently associated with adverse drug reactions (ADRs).

## 3. Simulated Case Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Case ID | Drug Name | Patient Age/Gender | Reported Reaction | Outcome | Causality |
| DEMO-01 | Simvastatin | 51/M | Muscle spasms | Recovered | Probable |
| DEMO-02 | Ciprofloxacin | 38/F | Tendonitis | Not Recovered | Possible |
| DEMO-03 | Montelukast | 22/M | Anaphylactic shock | Hospitalization | Definite |
| DEMO-04 | Paracetamol | 17/F | Diarrhea | Not Recovered | Possible |
| DEMO-05 | Atenolol-Amlodipine | 65/F | Hypotension | Hospitalization | Probable |
| DEMO-06 | Salmeterol | 33/M | Tremors | Recovered | Probable |
| DEMO-07 | Aceclofenac | 29/F | Indigestion | Recovered | Possible |
| DEMO-08 | Ceftriaxone | 44/F | Injection site edema | Recovered | Definite |
| DEMO-09 | Amoxicillin-clavulanic acid | 12/M | Skin rash | Recovered | Probable |
| DEMO-10 | Metformin-Glimiperide | 76/M | Hypoglycemia | Hospitalization | Definite |

## 4. ICSR Workflow Simulation

1. Case Receipt & Data Entry – Initial ADR information recorded in standardized format (e.g., MedWatch form).
2. Case Validation – Verified for minimum criteria: identifiable patient, reporter, suspect drug, and event.
3. Case Triage – Classified as serious or non-serious based on outcome.

Seriousness criteria – Death, Life-threatening, Hospitalization and Disabilisation

Non-serious – Recovered, No hospitalization.

1. Medical Review – Evaluated for causality (Naranjo assessment scale) and completeness; narrative written.

**Naranjo assessment scale:**

The ADR Probability Scale consists of 10 questions that are answered as either Yes, No, or “Do not know”. Different point values (-1, 0, +1 or +2) are assigned to each answer. A simplified version of the 10 questions is provided below:

* Are there previous conclusive reports of this reaction?
* Did the adverse event appear after the drug was given?
* Did the adverse reaction improve when the drug was discontinued or a specific antagonist was given?
* Did the adverse reaction reappear upon readministering the drug?
* Were there other possible causes for the reaction?
* Did the adverse reaction reappear upon administration of placebo?
* Was the drug detected in the blood or other fluids in toxic concentrations?
* Was the reaction worsened upon increasing the dose? Or, was the reaction lessened upon decreasing the dose?
* Did the patient have a similar reaction to the drug or a related agent in the past?
* Was the adverse event confirmed by any other objective evidence?

1. Case closure and regulatory submission.

## 5. Case Narrative

DEMO-01 — A 51-year-old male patient experienced muscle spasms following the use of simvastatin for dyslipidemia. The reaction occurred after 2 hours of starting of dose with gradual increase over the span of drug use for 7 days. The case was validated as non-serious and medically confirmed. The patient recovered after replacement of therapy with fluvastatin. Based on temporal relationship and dechallenge, the causality was assessed as 'probable'.

DEMO-02 – A 38-year-old female developed tendonitis after starting the use of ciprofloxacin for acute pyelonephritis. The reaction occurred after administration of drug for continuous period of 48 hours as directed by the physician, it is also reported that patient was also taking levothyroxine and liothyronine (30 mg) tablets for Hypothyroidism. The patient is started with ibuprofen therapy for recovery and has not recovered yet. The case was validated as non-serious and medically confirmed. Based on temporal relationship and dechallenge, the causality was assessed as ‘possible’.

DEMO-03 – A 22-year-old male patient was admitted in the hospital on February 06, 2024 after suffering from a sudden anaphylactic shock, occurring less than 7 hours with Blood pressure lowering up to 90/60 mm Hg and body temperature exceeding 104℉ after the administration of two formulations - Montelukast sodium and Paracetamol, Phenylephrine and Chlorpheniramine indicated for Sinusitis. The patient was started with amoxicillin I.V, Saline and Paracetamol I.V therapy and was diagnosed with an unclear respiratory condition likely congenital lobe emphysema during the process, with patient having no history of smoking. The case was validated as serious and medically confirmed. Patient recovered to normal blood pressure condition and body temperature after 72 hours of starting treatment and was discharged after 108 hours after hospitalization date i.e. on February 11, 2024. Based on temporal relationship and dechallenge information, the causal relationship was found to be ‘definite’.

DEMO-04 – A 17-year-old female patient experienced diarrhea with 3 episodes of loose stools and 1 episode of vomiting after administration of 650 mg paracetamol for fever, body temperature - 101℉. The patient recovered after treatment with Bismuth subsalicylate. The case was validated as non-serious and medically confirmed. Based on dechallenge information and temporal relationship (unclear) the case was regarded as ‘possible’.

DEMO-05 – A 65-year-old female patient suffered from severe hypotension, bp falling up t0 70/50 mm Hg, after starting atenolol-amlodipine combination for hypertension. The patient, with history of suffering with myocardial infraction, was rushed to hospital on Aug 30, 2024. The case was validated as Serious and medically confirmed. The patient was started with saline treatment and the use of any other medications were uncleared. Patient recovered after 48 hours of hospitalization and was discharged after 72 hours. Based on dechallenge information and temporal relationship, the case was regarded as ‘probable’.

DEMO-06 – A 33-year-old male patient gradually developed tremors after taking salmeterol inhaler therapy for Bronchial asthma. Patient reported shivering all over the body after taking the dose. The case was validated as non-serious. The patient was given with primidone for tremors and salmeterol was replaced with salbutamol therapy following this, the patient recovered. Based on dechallenge information and temporal relationship, the causality was regarded as ‘probable’.

DEMO-07 – A 29-year-old female patient experienced indigestion following the administration of Aceclofenac as reported by physician. The case was validated as non-serious and medically confirmed. Patient reportedly used omeprazole tablets for the same and recovered, physician advised to discontinue the use of aceclofenac. Based on dechallenge information and temporal relationship, the causality was regarded as ‘possible’.

DEMO-08 – A 44-year-old female patient observed swelling(edema) at injection-site (left arm) after administration of ceftriaxone intramuscular injection for typhoid fever as reported by physician. The case was validated as non-serious and medically confirmed. The recovery happened after 6-8 hours post administration. Based on the dechallenge information and temporal relationship, the causality was determined to be ‘definite’.

DEMO-09 – A 12-year-old male child experienced skin rash after using amoxicillin-clavulanic acid combination for throat infection, as reported by physician. The case was medically confirmed and regarded as non-serious. Patient used Benzalkonium-Zinc oxide cream for skin rash and recovered within 1 week. Based on dechallenge information and temporal relationship, the causality was regarded as ‘Probable’.

DEMO-10 – A 76-year-old male patient suffered with sudden hypoglycemia with blood glucose levels reaching 65 mg/dL after 2 hours of administration of metformin-glimepiride combination, patient was rushed into the nearby hospital at 9:00 PM on September 26, 2024 and the patient was admitted and started with glucagon injection (as the patient fell unconscious during transportation) as reported by physician. The case was medically confirmed and regarded as serious. The patient recovered to normal on the following day and was discharged on September 28, 2024. Based on dechallenge information and temporal relationship, the causality was determined as ‘definite’

## 6. Summary and Conclusion

This simulation project successfully demonstrates how Individual Case Safety Reports are processed in pharmacovigilance. The workflow covered case intake, validation, triage, and medical review. By simulating 10 cases using open-source data, the exercise provides practical exposure to core PV operations.

## 7. Sources

1. <https://www.vigiaccess.org/>

2. <https://open.fda.gov/data/downloads/>

3. <https://www.adrreports.eu/en/search_subst.html#>

4. <https://openvigil.sourceforge.net/>