**PART 1: SDG Selection and Problem Definition**

* **SDG Selection:** Choose an SDG - SDG 3: Good Health and Well-Being
* **Problem Definition:** High maternal mortality rates in rural areas due to inadequate healthcare facilities and access.
* **Data-Driven Solution**: Analyzing maternal health outcomes (live birth, stillbirth, complications) in relation to healthcare facilities, demographics, and location.

**PART 2 Database Design**

**ERD (Entity-Relationship Diagram)**:

* **Entities**:
  + **Mothers** (id, name, age, location)
  + **Healthcare Facilities** (id, name, type, location)
  + **Pregnancies** (id, mother\_id, facility\_id, outcome, date).

**Relationships**:

* A mother can have multiple pregnancies-**1-to-many** line from Mothers to Pregnancies (One mother can have many pregnancies).
* Each pregnancy is linked to a healthcare facility -**1-to-many** line from HealthcareFacilities to Pregnancies (One healthcare facility can handle many pregnancies).

**Database Schema**:

CREATE TABLE Mothers (

id INT PRIMARY KEY,

name VARCHAR(100),

age INT,

location VARCHAR (100)

);

CREATE TABLE HealthcareFacilities (

id INT PRIMARY KEY,

name VARCHAR(100),

type VARCHAR(50),

location VARCHAR(100)

);

CREATE TABLE Pregnancies (

id INT PRIMARY KEY,

mother\_id INT,

facility\_id INT,

outcome VARCHAR(50),

date DATE,

FOREIGN KEY (mother\_id) REFERENCES Mothers(id),

FOREIGN KEY (facility\_id) REFERENCES HealthcareFacilities(id)

);

**Sample Data:**

1. **Mothers Table**:

INSERT INTO Mothers (id, name, age, location) VALUES

(1, 'Alice', 25, 'Rural Area 1'),

(2, 'Beth', 30, 'Rural Area 1'),

(3, 'Cathy', 22, 'Rural Area 2'),

(4, 'Diana', 35, 'Rural Area 2'),

(5, 'Ella', 28, 'Rural Area 3'),

(6, 'Fiona', 27, 'Rural Area 3'),

(7, 'Grace', 24, 'Rural Area 1'),

(8, 'Hannah', 31, 'Rural Area 2'),

(9, 'Isla', 26, 'Rural Area 3'),

(10, 'Jade', 23, 'Rural Area 1'),

(11, 'Kara', 29, 'Rural Area 2'),

(12, 'Lila', 32, 'Rural Area 3');

1. **HealthcareFacilities Table**:

INSERT INTO HealthcareFacilities (id, name, type, location) VALUES

(1, 'Community Clinic A', 'Clinic', 'Rural Area 1'),

(2, 'Community Clinic B', 'Clinic', 'Rural Area 1'),

(3, 'Hospital C', 'Hospital', 'Rural Area 2'),

(4, 'Community Clinic D', 'Clinic', 'Rural Area 2'),

(5, 'Hospital E', 'Hospital', 'Rural Area 3'),

(6, 'Community Clinic F', 'Clinic', 'Rural Area 3');

1. **Pregnancies Table**:

INSERT INTO Pregnancies (id, mother\_id, facility\_id, outcome, date) VALUES

(1, 1, 1, 'Live Birth', '2023-01-01'),

(2, 1, 2, 'Live Birth', '2023-06-15'),

(3, 2, 1, 'Live Birth', '2023-03-20'),

(4, 3, 3, 'Stillbirth', '2023-02-10'),

(5, 4, 4, 'Live Birth', '2023-07-25'),

(6, 5, 5, 'Live Birth', '2023-04-30'),

(7, 6, 6, 'Complication', '2023-05-05'),

(8, 7, 1, 'Live Birth', '2023-08-12'),

(9, 8, 3, 'Live Birth', '2023-09-19'),

(10, 9, 5, 'Live Birth', '2023-10-10'),

(11, 10, 2, 'Live Birth', '2023-11-15'),

(12, 11, 4, 'Stillbirth', '2023-12-20');

**PART 3 SQL Programming**

**Data Retrieval:**

* The query below retrieves all pregnancies associated with live birth

SELECT \* FROM Pregnancies WHERE outcome = 'Live Birth';

* **Retrieve pregnancies by mother -**This query retrieves all pregnancies associated with a specific mother (e.g., mother with id = 1).

SELECT \* FROM Pregnancies WHERE mother\_id = 1;

* Retrieve pregnancies by date range -This query retrieves pregnancies that occurred within a specific date range (e.g., between January 1, 2023, and December 31, 2023).

SELECT \* FROM Pregnancies WHERE date BETWEEN '2023-01-01' AND '2023-12-31';

* Retrieve recent pregnancies -This query retrieves the last five pregnancies recorded, ordered by date.

SELECT \* FROM Pregnancies ORDER BY date DESC LIMIT 5;

**Data analysis:**

* This query retrieves healthcare facilities grouped by type (e.g., Clinics and Hospitals)

SELECT type, COUNT(id) AS TotalFacilities

FROM HealthcareFacilities

GROUP BY type;

* Count of mothers by location -This query counts the number of mothers in each location.

SELECT location, COUNT(id) AS TotalMothers

FROM Mothers

GROUP BY location;

* Count of pregnancies by each health care facility -This query counts how many pregnancies were handled by each facility.

SELECT hf.name AS FacilityName, COUNT(p.id) AS TotalPregnancies

FROM Pregnancies p

JOIN HealthcareFacilities hf ON p.facility\_id = hf.id

GROUP BY hf.name;

* Average age of mothers by pregnancy outcome -This query calculates the average age of mothers grouped by the outcome of their pregnancies.

SELECT p.outcome, AVG(m.age) AS AverageMotherAge

FROM Pregnancies p

JOIN Mothers m ON p.mother\_id = m.id

GROUP BY p.outcome;