**### Part 1: SDG Selection and Problem Definition**

\*\*SDG Selection: SDG 3: Good Health\*\*

\*\*Problem Definition:\*\* Track and analyze the impact of vaccination programs on disease incidence.

### Part 2: Database Design

\*\*ERD Design:\*\*

1. \*\*Entities:\*\*

- \*\*Vaccinations:\*\* Tracks vaccination programs.

- \*\*Diseases:\*\* Tracks disease details.

- \*\*Patients:\*\* Tracks patient information.

- \*\*VaccinationRecords:\*\* Records of patient vaccinations.

2. \*\*ERD Diagram Example:\*\*

```

Patients --< VaccinationRecords >-- Vaccinations

|

|

Diseases

```

\*\*Schema:\*\*

```sql

CREATE TABLE Patients (

PatientID INT PRIMARY KEY,

Name VARCHAR(100),

Age INT,

Gender VARCHAR(10)

);

CREATE TABLE Diseases (

DiseaseID INT PRIMARY KEY,

DiseaseName VARCHAR(100),

Description TEXT

);

CREATE TABLE Vaccinations (

VaccineID INT PRIMARY KEY,

VaccineName VARCHAR(100),

DiseaseID INT,

FOREIGN KEY (DiseaseID) REFERENCES Diseases(DiseaseID)

);

CREATE TABLE VaccinationRecords (

RecordID INT PRIMARY KEY,

PatientID INT,

VaccineID INT,

DateAdministered DATE,

FOREIGN KEY (PatientID) REFERENCES Patients(PatientID),

FOREIGN KEY (VaccineID) REFERENCES Vaccinations(VaccineID)

);

```

\*\*Sample Data:\*\*

```sql

INSERT INTO Patients (PatientID, Name, Age, Gender) VALUES (1, 'John Doe', 25, 'Male');

INSERT INTO Patients (PatientID, Name, Age, Gender) VALUES (2, 'Jane Smith', 30, 'Female');

INSERT INTO Diseases (DiseaseID, DiseaseName, Description) VALUES (1, 'Flu', 'Seasonal influenza');

INSERT INTO Diseases (DiseaseID, DiseaseName, Description) VALUES (2, 'COVID-19', 'Coronavirus disease 2019');

INSERT INTO Vaccinations (VaccineID, VaccineName, DiseaseID) VALUES (1, 'Flu Vaccine', 1);

INSERT INTO Vaccinations (VaccineID, VaccineName, DiseaseID) VALUES (2, 'COVID-19 Vaccine', 2);

INSERT INTO VaccinationRecords (RecordID, PatientID, VaccineID, DateAdministered) VALUES (1, 1, 1, '2024-01-15');

INSERT INTO VaccinationRecords (RecordID, PatientID, VaccineID, DateAdministered) VALUES (2, 2, 2, '2024-02-20');

```

### Part 3: SQL Programming

\*\*Data Retrieval:\*\*

```sql

-- Retrieve all vaccination records

SELECT \* FROM VaccinationRecords;

-- Retrieve vaccination history for a specific patient

SELECT p.Name, v.VaccineName, vr.DateAdministered

FROM VaccinationRecords vr

JOIN Patients p ON vr.PatientID = p.PatientID

JOIN Vaccinations v ON vr.VaccineID = v.VaccineID

WHERE p.PatientID = 1;

```

\*\*Data Analysis:\*\*

```sql

-- Count vaccinations administered for each disease

SELECT d.DiseaseName, COUNT(vr.RecordID) AS NumberOfVaccinations

FROM VaccinationRecords vr

JOIN Vaccinations v ON vr.VaccineID = v.VaccineID

JOIN Diseases d ON v.DiseaseID = d.DiseaseID

GROUP BY d.DiseaseName;

-- Average age of patients vaccinated

SELECT AVG(p.Age) AS AverageAge

FROM VaccinationRecords vr

JOIN Patients p ON vr.PatientID = p.PatientID;

```

### Part 4: Data Analysis Using Excel

1. \*\*Import Data:\*\* Use Excel’s “Get Data” feature to import data from your SQL database.

2. \*\*Analysis:\*\*

- Create \*\*Pivot Tables\*\* to analyze vaccination counts and average age.

- Use \*\*Charts\*\* (e.g., bar charts, pie charts) to visualize vaccination distribution and age demographics.

3. \*\*Dashboard:\*\*

- Create an interactive dashboard with slicers and charts to dynamically explore vaccination data and insights.

### Part 5: Integration and Testing

\*\*Integration Documentation:\*\*

- Document steps for importing data from SQL to Excel.

- Ensure data consistency by comparing data in SQL and Excel.

\*\*Testing:\*\*

- Verify that Excel dashboards accurately reflect data from SQL queries.

- Test Excel dashboard interactivity and accuracy.

### Part 6: Presentation

\*\*Pitch Deck:\*\*

1. \*\*Project Overview and SDG Alignment:\*\* Describe how the project aligns with SDG 3.

2. \*\*Problem Definition and Significance:\*\* Explain the health issue and the role of vaccination data.

3. \*\*Database Design and Schema:\*\* Present ERD and schema.

4. \*\*Data Analysis Insights:\*\* Share insights from SQL queries and data analysis.

5. \*\*Excel Dashboard Demonstration:\*\* Showcase the interactive dashboard.

\*\*Deliverables:\*\*

1. SDG Problem Definition Document

2. ERD

3. SQL Scripts

4. Excel Workbook with Data Analysis and Dashboard

5. Integration Documentation

6. Pitch Deck Presentation (provide a link to Canva or Gamma for your presentation)

Feel free to adjust the specifics based on your selected SDG and problem definition.