SELECT \*

FROM dbo.Covid\_Deaths

SELECT \*

FROM dbo.Covid\_Vaccinations

--GLOBAL TRENDS

--1. Total cases, deaths, and vaccinations over time (Country-Wise)

SELECT D.date,

SUM(TRY\_CAST(D.total\_cases AS FLOAT)) AS Total\_Cases,

SUM(TRY\_CAST(D.total\_deaths AS FLOAT)) AS Total\_Deaths,

SUM(TRY\_CAST(V.total\_vaccinations AS FLOAT)) AS Total\_Vaccinations

FROM dbo.Covid\_Deaths D

JOIN dbo.Covid\_Vaccinations V

ON D.iso\_code=V.iso\_code

AND D.date=V.date

WHERE D.location = 'World' -- Focuses only on global data

GROUP BY D.date

ORDER BY D.date

--2. Countries with Highest Cases, Deaths, and Vaccinations (Highest to Lowest)

SELECT D.location,

MAX(TRY\_CAST(D.total\_cases AS FLOAT)) AS Max\_Cases,

MAX(TRY\_CAST(D.total\_deaths AS FLOAT)) AS Max\_Deaths,

MAX(TRY\_CAST(V.total\_vaccinations AS FLOAT)) AS Max\_Vaccinations

FROM dbo.Covid\_Deaths D

JOIN dbo.Covid\_Vaccinations V

ON D.iso\_code = V.iso\_code

AND D.date = V.date

WHERE D.continent IS NOT NULL -- Excludes continents & world-level data

GROUP BY D.location

ORDER BY Max\_Cases DESC

--MORTALITY ANALYSIS

--3. Case fatality rate (CFR) (Total Deaths / Total Cases)

--NULLIF(..., 0) prevents division by zero by returning NULL if a country has 0 total cases.

--FORMAT(..., 'N2') Formats the result to 2 decimal places

--CONCAT(..., ' %') Adds a % to the formatted number

SELECT location,

CONCAT(

FORMAT(

MAX(TRY\_CAST(total\_deaths AS FLOAT))

/NULLIF(MAX(TRY\_CAST(total\_cases AS FLOAT)), 0)\*100 ,

'N2'),

'%' )AS CFR\_PCT

FROM dbo.Covid\_Deaths

WHERE continent IS NOT NULL -- Excludes continents & world-level data

GROUP BY location

ORDER BY MAX(TRY\_CAST(total\_deaths AS FLOAT))

/NULLIF(MAX(TRY\_CAST(total\_cases AS FLOAT)), 0)\*100 DESC -- Numeric sorting

--4. Deadliest Month (Highest Monthly Deaths)

--DATEFROMPARTS(YEAR(date), MONTH(date), 1), 'YYYY-MM') makes it easier to format as YYYY-MM

SELECT location,

FORMAT(DATEFROMPARTS(YEAR(date), MONTH(date), 1), 'yyyy-MM') AS Month,

SUM(TRY\_CAST(new\_deaths AS FLOAT)) AS Monthly\_Deaths

FROM dbo.Covid\_Deaths

WHERE continent IS NOT NULL -- Excludes continents & world-level data

GROUP BY location, YEAR(date), MONTH(date)

ORDER BY Monthly\_Deaths DESC

--VACCINATION IMPACT

--5. Impact of Vaccination on Deaths Over Time

SELECT

D.location,

FORMAT(DATEFROMPARTS(YEAR(D.date), MONTH(D.date), 1), 'yyyy-MM') AS Month,

SUM(TRY\_CAST(V.new\_vaccinations AS FLOAT)) AS Monthly\_New\_Vaccinations,

SUM(TRY\_CAST(D.new\_deaths AS FLOAT)) AS Monthly\_New\_Deaths

FROM dbo.Covid\_Deaths D

JOIN dbo.Covid\_Vaccinations V

ON D.iso\_code = V.iso\_code

AND D.date = V.date

WHERE D.continent IS NOT NULL

AND D.new\_deaths IS NOT NULL

AND V.new\_vaccinations IS NOT NULL

GROUP BY D.location, YEAR(D.date), MONTH(D.date)

ORDER BY D.location, Month;

-- CASE DETECTION RATE

--6.Testing Rates vs. Case Detection by calculating the percentage of tests that resulted in confirmed cases

SELECT

D.location,

FORMAT(DATEFROMPARTS(YEAR(D.date), MONTH(D.date), 1), 'yyyy-MM') AS Month,

SUM(TRY\_CAST(V.new\_tests AS FLOAT)) AS Monthly\_Tests,

SUM(TRY\_CAST(D.new\_cases AS FLOAT)) AS Monthly\_Cases,

CASE

WHEN SUM(TRY\_CAST(V.new\_tests AS FLOAT)) = 0 THEN NULL

ELSE (SUM(TRY\_CAST(D.new\_cases AS FLOAT)) / NULLIF(SUM(TRY\_CAST(V.new\_tests AS FLOAT)), 0)) \* 100

END AS Case\_Detection\_Rate\_PCT

FROM dbo.Covid\_Deaths D

JOIN dbo.Covid\_Vaccinations V

ON D.iso\_code = V.iso\_code

AND D.date = V.date

WHERE D.continent IS NOT NULL

AND D.new\_cases IS NOT NULL

AND V.new\_tests IS NOT NULL

GROUP BY D.location, YEAR(D.date), MONTH(D.date)

ORDER BY D.location, Month;

--CONTINENTAL COMPARISON

--7.Which continents handled the pandemic better?

--Lower CFR% is better. Indicates how deadly the virus has been in terms of the number of cases.

--Higher Case\_Detection Rate PCT is better. Indicates how effective the testing system is in detecting COVID-19 cases.

--Higher Vaccination Coverage PCT is better. Indicates how many people are vaccinated, reflecting progress in immunity and control of the pandemic.

SELECT

D.continent,

(SUM(TRY\_CAST(D.total\_deaths AS FLOAT)) / NULLIF(SUM(TRY\_CAST(D.total\_cases AS FLOAT)), 0)) \* 100 AS CFR\_PCT,

(SUM(TRY\_CAST(D.total\_cases AS FLOAT)) / NULLIF(SUM(TRY\_CAST(V.total\_tests AS FLOAT)), 0)) \* 100 AS Case\_Detection\_Rate\_PCT,

(SUM(TRY\_CAST(V.total\_vaccinations AS FLOAT)) / NULLIF(SUM(TRY\_CAST(D.population AS FLOAT)), 0)) \* 100 AS Vaccination\_Coverage\_PCT

FROM dbo.Covid\_Deaths D

JOIN dbo.Covid\_Vaccinations V

ON D.iso\_code = V.iso\_code

AND D.date = V.date

WHERE D.continent IS NOT NULL

GROUP BY D.continent

ORDER BY CFR\_PCT ASC;