

Coronavirus (COVID-19) SQL Data Exploration Queries

Data Source: <https://ourworldindata.org/covid-deaths>

Data Task: SQL Data Exploration of Global COVID Cases, Deaths and Vaccinations

```
-- Explore the continent
SELECT
    DISTINCT continent
FROM
    Covid2024.dbo.CovidDeaths
```

	continent
1	Africa
2	NULL
3	North America
4	Asia
5	South America
6	Europe
7	Oceania

-- Explore continent with NULL values

```
SELECT
    continent, location
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NULL
GROUP BY
    continent, location
```

	continent	location
1	NULL	World
2	NULL	Europe
3	NULL	Upper middle income
4	NULL	European Union
5	NULL	Lower middle income
6	NULL	Asia
7	NULL	Africa
8	NULL	Low income
9	NULL	Oceania
10	NULL	North America
11	NULL	South America
12	NULL	High income

-- Based on World data, what is the cumulative total Covid Deaths and Total Covid Cases?
[Based on the redundant column Where continent is NULL]

```
SELECT
    location,
    SUM(new_deaths) AS Global_total_deaths,
    SUM(new_cases) AS Global_total_Cases
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NULL
    AND
    location LIKE '%World%'
GROUP BY
    Location
```

	location	Global_total_deaths	Global_total_Cases
1	World	7045496	775075962

-- Based on Income Bracket, What is the cumulative total Covid Deaths and Total Covid Cases?

```
SELECT
    continent,
    location,
    SUM(new_deaths) AS incomeBracket_total_deaths,
    SUM(new_cases) AS incomeBracket_total_Cases,
    SUM(SUM(new_deaths)) OVER (PARTITION BY continent) AS total_deaths,
    SUM(SUM(new_cases)) OVER (PARTITION BY continent) AS total_Cases
FROM Covid2024.dbo.CovidDeaths
WHERE
    continent IS NULL
    AND
    location LIKE '%income%'
GROUP BY
    continent,location
```

	continent	location	incomeBracket_total_deaths	incomeBracket_total_Cases	total_deaths	total_Cases
1	NULL	Low income	48046	2328020	7041526	773862261
2	NULL	High income	2985243	428388602	7041526	773862261
3	NULL	Upper middle income	2666830	245561101	7041526	773862261
4	NULL	Lower middle income	1341407	97584538	7041526	773862261

-- Based on the continent, What is the cumulative total Covid Deaths and Total Covid Cases? [Based on the redundant column Where continent is NULL]

```
SELECT
    continent,
    location,
    SUM(new_deaths) AS continent_total_deaths,
    SUM(new_cases) AS continent_total_Cases,
    SUM(SUM(new_deaths)) OVER (PARTITION BY continent) AS total_deaths,
    SUM(SUM(new_cases)) OVER (PARTITION BY continent) AS total_Cases
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NULL
    AND
    location NOT LIKE '%income%'
    AND
    location NOT LIKE '%Union%'
    AND
    location NOT LIKE '%World%'
GROUP BY
    continent, location
```

	continent	location	continent_total_deaths	continent_total_Cases	total_deaths	total_Cases
1	NULL	Oceania	32341	14814266	7045478	775069705
2	NULL	Europe	2099466	252417184	7045478	775069705
3	NULL	Asia	1636963	301451451	7045478	775069705
4	NULL	Africa	259099	13141439	7045478	775069705
5	NULL	North America	1661225	124525327	7045478	775069705
6	NULL	South America	1356384	68720038	7045478	775069705

```
-- Based on each country, What is Cumulative total Covid Deaths and Total Covid Cases?
-- Also compare it to the total of the continent it belongs to
```

```
SELECT
    continent,
    location,
    SUM(new_deaths) AS country_total_deaths,
    SUM(new_cases) AS country_total_infections,
    SUM(SUM(new_deaths)) OVER (PARTITION BY continent) AS continent_total_deaths,
    SUM(SUM(new_cases)) OVER (PARTITION BY continent) AS continent_total_cases
FROM
    Covid2024.dbo.CovidDeaths
GROUP BY
    continent, location
ORDER BY
    continent, location
```

	continent	location	country_total_deaths	country_total_infections	continent_total_deaths	continent_total_cases
1	NULL	Africa	259099	13141439	22393215	2509617180
2	NULL	Asia	1636963	301451451	22393215	2509617180
3	NULL	Europe	2099466	252417184	22393215	2509617180
4	NULL	European Union	1260715	185609252	22393215	2509617180
5	NULL	High income	2985243	428388602	22393215	2509617180
6	NULL	Low income	48046	2328020	22393215	2509617180
7	NULL	Lower middle income	1341407	97584538	22393215	2509617180
8	NULL	North America	1661225	124525327	22393215	2509617180
9	NULL	Oceania	32341	14814266	22393215	2509617180
10	NULL	South America	1356384	68720038	22393215	2509617180
11	NULL	Upper middle income	2666830	245561101	22393215	2509617180
12	NULL	World	7045496	775075962	22393215	2509617180
13	Africa	Algeria	6881	272010	259099	13141439
14	Africa	Angola	1937	107327	259099	13141439
15	Africa	Benin	163	28036	259099	13141439
16	Africa	Botswana	2801	330638	259099	13141439
17	Africa	Burkina Faso	400	22114	259099	13141439
18	Africa	Burundi	15	54670	259099	13141439
19	Africa	Cameroon	1974	125146	259099	13141439
20	Africa	Cape Verde	417	64474	259099	13141439
21	Africa	Central African Republic	113	15440	259099	13141439
22	Africa	Chad	194	7698	259099	13141439
23	Africa	Comoros	160	9109	259099	13141439
24	Africa	Congo	389	25215	259099	13141439
25	Africa	Cote d'Ivoire	835	88384	259099	13141439
26	Africa	Democratic Republic of Congo	1468	99338	259099	13141439
27	Africa	Djibouti	189	15690	259099	13141439
28	Africa	Egypt	24830	516023	259099	13141439

-- How many Covid Deaths and New Covid Infections per day in each country?

```
SELECT
    location,
    date,
    new_cases,
    new_deaths
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NOT NULL
ORDER BY
    location, date
```

	location	date	new_cases	new_deaths
58...	Canada	2020-08-24 00:00:00.000	0	0
58...	Canada	2020-08-25 00:00:00.000	0	0
58...	Canada	2020-08-26 00:00:00.000	0	0
58...	Canada	2020-08-27 00:00:00.000	0	0
58...	Canada	2020-08-28 00:00:00.000	0	0
58...	Canada	2020-08-29 00:00:00.000	0	0
58...	Canada	2020-08-30 00:00:00.000	2938	49
58...	Canada	2020-08-31 00:00:00.000	0	0
58...	Canada	2020-09-01 00:00:00.000	0	0
58...	Canada	2020-09-02 00:00:00.000	0	0
58...	Canada	2020-09-03 00:00:00.000	0	0
58...	Canada	2020-09-04 00:00:00.000	0	0
58...	Canada	2020-09-05 00:00:00.000	0	0
58...	Canada	2020-09-06 00:00:00.000	3814	29
58...	Canada	2020-09-07 00:00:00.000	0	0
58...	Canada	2020-09-08 00:00:00.000	0	0
58...	Canada	2020-09-09 00:00:00.000	0	0
58...	Canada	2020-09-10 00:00:00.000	0	0
58...	Canada	2020-09-11 00:00:00.000	0	0
58...	Canada	2020-09-12 00:00:00.000	0	0
58...	Canada	2020-09-13 00:00:00.000	4502	22
58...	Canada	2020-09-14 00:00:00.000	0	0
58...	Canada	2020-09-15 00:00:00.000	0	0

-- What is Cumulative total Covid Deaths and Total Covid Cases per day in each country?

```
SELECT
    location, date, new_cases, new_deaths,
    SUM(new_cases) OVER (PARTITION BY location
                        ORDER BY date) AS toalCovidCases,
    SUM(new_deaths) OVER (PARTITION BY location
                        ORDER BY date) AS totalCovidDeaths
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NOT NULL
ORDER BY
    location, date
```

	location	date	new_cases	new_deaths	toalCovidCases	totalCovidDeaths
60...	Canada	2024-02-03 00:00:00.000	0	0	4774367	54653
60...	Canada	2024-02-04 00:00:00.000	2350	37	4776717	54690
60...	Canada	2024-02-05 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-06 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-07 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-08 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-09 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-10 00:00:00.000	0	0	4776717	54690
60...	Canada	2024-02-11 00:00:00.000	2046	33	4778763	54723
60...	Canada	2024-02-12 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-13 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-14 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-15 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-16 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-17 00:00:00.000	0	0	4778763	54723
60...	Canada	2024-02-18 00:00:00.000	1831	31	4780594	54754
60...	Canada	2024-02-19 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-20 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-21 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-22 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-23 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-24 00:00:00.000	0	0	4780594	54754
60...	Canada	2024-02-25 00:00:00.000	1565	31	4782159	54785
60...	Canada	2024-02-26 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-02-27 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-02-28 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-02-29 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-03-01 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-03-02 00:00:00.000	0	0	4782159	54785
60...	Canada	2024-03-03 00:00:00.000	1421	25	4783580	54810
60...	Canada	2024-03-04 00:00:00.000	0	0	4783580	54810
60...	Canada	2024-03-05 00:00:00.000	0	0	4783580	54810
60...	Canada	2024-03-06 00:00:00.000	0	0	4783580	54810

```
-- COVID Death % per country: Of the total cases of people who got COVID, what is the
percentage of people who died?
```

```
SELECT
    location,
    SUM(new_cases) AS TotalCases,
    SUM(new_deaths) AS TotalDeaths,
    ROUND((MAX(total_deaths)/MAX(total_cases))*100,2) AS DeathPercentage
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NOT NULL
GROUP BY
    location
ORDER BY
    DeathPercentage DESC
```

	location	TotalCases	TotalDeaths	DeathPercentage
1	Yemen	11945	2159	18.07
2	Sudan	63993	5046	7.89
3	Syria	57423	3163	5.51
4	Somalia	27334	1361	4.98
5	Peru	4524748	220831	4.88
6	Egypt	516023	24830	4.81
7	Mexico	7702809	334958	4.35
8	Bosnia and Herzegovina	403615	16388	4.06
9	Liberia	8090	294	3.63
10	Afghanistan	232616	7985	3.43
11	Ecuador	1070126	36032	3.37
12	Niger	9515	315	3.31
13	Myanmar	641923	19494	3.04
14	Malawi	89256	2686	3.01
15	Gambia	12626	372	2.95
16	Bulgaria	1329104	38700	2.91
17	North Macedonia	350577	9977	2.85
18	Paraguay	735759	19880	2.7
19	Tunisia	1153361	29423	2.55
20	Algeria	272010	6881	2.53
21	Chad	7698	194	2.52
22	South Africa	4072636	102595	2.52
23	Haiti	34298	860	2.51
24	Sri Lanka	672754	16899	2.51
25	Namibia	172399	4106	2.38
26	Indonesia	6828919	162060	2.37
27	Honduras	472783	11114	2.35
28	Jamaica	156797	3595	2.29
29	Trinidad and Tobago	191496	4390	2.29
30	Mali	33164	743	2.24
31	Colombia	6384363	142727	2.24

-- Infection % per country: Of the total population, what is the percentage of those who got COVID?

```
SELECT
    location,
    SUM(new_cases) AS TotalCases,
    MAX(population) AS TotalPopulation,
    ROUND((MAX(total_cases)/MAX(population))*100,2) AS InfectionPercentage
FROM
    Covid2024.dbo.CovidDeaths
WHERE
    continent IS NOT NULL
GROUP BY
    location
ORDER BY
    InfectionPercentage DESC
```

	location	TotalCases	TotalPopulation	InfectionPercentage
1	Cyprus	690547	896007	77.07
2	Brunei	343719	449002	76.55
3	San Marino	25292	33690	75.07
4	Austria	6081287	8939617	68.03
5	South Korea	34571873	51815808	66.72
6	Faeroe Islands	34658	53117	65.25
7	Slovenia	1355830	2119843	63.96
8	Gibraltar	20550	32677	62.89
9	Martinique	230354	367512	62.68
10	Luxembourg	391251	647601	60.42
11	Andorra	48015	79843	60.14
12	Jersey	66391	110796	59.92
13	Denmark	3434511	5882259	58.39
14	Saint Pierre and Miquelon	3426	5885	58.22
15	France	38997490	67813000	57.51
16	Iceland	209914	372903	56.29
17	Guernsey	35326	63329	55.78
18	Portugal	5643062	10270857	54.94
19	Liechtenstein	21575	39355	54.82
20	Greece	5627605	10384972	54.19
21	Singapore	3006155	5637022	53.33
22	Latvia	977701	1850654	52.83
23	Guadeloupe	203235	395762	51.35
24	Israel	4841558	9449000	51.24
25	Switzerland	4453053	8740471	50.95
26	Niue	993	1952	50.87
27	Reunion	494595	974062	50.78
28	Falkland Islands	1923	3801	50.59
29	Saint Barthelemy	5507	10994	50.09
30	Georgia	1862326	3744385	49.74
31	Lithuania	1365593	2750058	49.66

```
-- Get Cumulative of vaccines given
SELECT
    deaths.continent,
    deaths.location,
    deaths.date,
    deaths.population,
    SUM(CAST(vaccines.new_vaccinations AS BIGINT)) OVER (PARTITION BY deaths.location
                                                         ORDER BY deaths.date) AS
TotalVaccinationsGiven
FROM
    Covid2024.dbo.CovidDeaths deaths
INNER JOIN
    Covid2024.dbo.CovidVaccinations vaccines
    ON deaths.location=vaccines.location
    AND deaths.date=vaccines.date
WHERE
    deaths.continent IS NOT NULL
ORDER BY
    deaths.location, deaths.date ASC
```

55...	North A...	Canada	2020-12-10 00:00:00.000	38454328	NULL
55...	North A...	Canada	2020-12-11 00:00:00.000	38454328	NULL
55...	North A...	Canada	2020-12-12 00:00:00.000	38454328	NULL
55...	North A...	Canada	2020-12-13 00:00:00.000	38454328	NULL
55...	North A...	Canada	2020-12-14 00:00:00.000	38454328	NULL
55...	North A...	Canada	2020-12-15 00:00:00.000	38454328	721
55...	North A...	Canada	2020-12-16 00:00:00.000	38454328	3022
55...	North A...	Canada	2020-12-17 00:00:00.000	38454328	7277
55...	North A...	Canada	2020-12-18 00:00:00.000	38454328	11292
55...	North A...	Canada	2020-12-19 00:00:00.000	38454328	12369
55...	North A...	Canada	2020-12-20 00:00:00.000	38454328	13231
55...	North A...	Canada	2020-12-21 00:00:00.000	38454328	21080
55...	North A...	Canada	2020-12-22 00:00:00.000	38454328	26872
55...	North A...	Canada	2020-12-23 00:00:00.000	38454328	35565
55...	North A...	Canada	2020-12-24 00:00:00.000	38454328	45768
55...	North A...	Canada	2020-12-25 00:00:00.000	38454328	48821
55...	North A...	Canada	2020-12-26 00:00:00.000	38454328	48836
55...	North A...	Canada	2020-12-27 00:00:00.000	38454328	52448
55...	North A...	Canada	2020-12-28 00:00:00.000	38454328	59074
55...	North A...	Canada	2020-12-29 00:00:00.000	38454328	72087
55...	North A...	Canada	2020-12-30 00:00:00.000	38454328	80636
55...	North A...	Canada	2020-12-31 00:00:00.000	38454328	96165
55...	North A...	Canada	2021-01-01 00:00:00.000	38454328	105456
55...	North A...	Canada	2021-01-02 00:00:00.000	38454328	110113
55...	North A...	Canada	2021-01-03 00:00:00.000	38454328	115334
55...	North A...	Canada	2021-01-04 00:00:00.000	38454328	138961
55...	North A...	Canada	2021-01-05 00:00:00.000	38454328	156840
55...	North A...	Canada	2021-01-06 00:00:00.000	38454328	184952

```

DROP Table if exists
    #PercentPopulationVaccinated

-- Creating TEMP Table to Show summary of Vaccination data
CREATE Table
    #PercentPopulationVaccinated
(
    continent nvarchar(255),
    location nvarchar(255),
    date datetime,
    Population numeric,
    new_vaccinations numeric,
    people_fully_vaccinated numeric,
    TotalPeopleVaccinated bigint
)

-- Fill table with data
INSERT INTO
    #PercentPopulationVaccinated
SELECT
    deaths.continent,
    deaths.location,
    deaths.date,
    deaths.population,
    vaccines.new_vaccinations,
    vaccines.people_fully_vaccinated,
    SUM(CAST(vaccines.new_vaccinations AS BIGINT)) OVER (PARTITION BY deaths.location
                                                         ORDER BY deaths.date) AS
TotalVaccinations
FROM
    Covid2024.dbo.CovidDeaths deaths
INNER JOIN
    Covid2024.dbo.CovidVaccinations vaccines
    ON deaths.location=vaccines.location
    AND deaths.date=vaccines.date

```

```
-- View % of People Fully Vaccinated in each country
```

```
SELECT
    location,
    SUM(new_vaccinations) AS TotalVaccinationsComputed,
    MAX(people_fully_vaccinated) AS TotalPeopleVaccinated,
    MAX(population) AS TotalPopulation,
    ROUND((MAX(people_fully_vaccinated)/MAX(population))*100,2) AS
VaccinatedPercentage
FROM
    #PercentPopulationVaccinated
GROUP BY
    location
ORDER BY
    VaccinatedPercentage DESC
```

ditor	Results	Messages		
location	TotalVaccinationsComputed	TotalPeopleVaccinated	TotalPopulation	VaccinatedPercentage
Macao	918831	642266	695180	92.3900000000000000
Singapore	14727002	5120969	5637022	90.8500000000000000
Hong Kong	20839153	6802817	7488863	90.8400000000000000
Chile	62671925	17700117	19603736	90.2900000000000000
Cuba	38404382	10051894	11212198	89.6500000000000000
China	3407595000	1276760000	1425887360	89.5400000000000000
Nauru	168	11346	12691	89.4000000000000000
Malta	1344360	471565	533293	88.4300000000000000
Cayman Islands	15339	60688	68722	88.3100000000000000
Nicaragua	0	6126708	6948395	88.1700000000000000
Cambodia	36482941	14691716	16767851	87.6200000000000000
Vietnam	140207439	85961564	98186856	87.5500000000000000
Taiwan	51180197	20793089	23893396	87.0200000000000000
Portugal	NULL	8909769	10270857	86.7500000000000000
Bhutan	862033	677669	782457	86.6100000000000000
Cook Islands	NULL	14728	17032	86.4700000000000000
Spain	62965910	40739123	47558632	85.6600000000000000
South Korea	129580486	44372679	51815808	85.6400000000000000
Uruguay	8966322	2903089	3422796	84.8200000000000000
Costa Rica	NULL	4369784	5180836	84.3500000000000000
Peru	91408722	28709644	34049588	84.3200000000000000
Tuvalu	NULL	9505	11335	83.8600000000000000
Niue	NULL	1635	1952	83.7600000000000000
Mauritius	35153	1088142	1299478	83.7400000000000000
Japan	383303948	103380343	123951696	83.4000000000000000
Bahrain	2954499	1226796	1472237	83.3300000000000000
Guernsey	15931	52710	63329	83.2300000000000000
Bangladesh	141662787	142197876	171186368	83.0700000000000000