1. Disease Spread Metrics

These help track how the virus is spreading:

KPI / Metric	Calculation / Notes	Insights
Daily New Cases	new_cases	Measures current infection trends. Peaks indicate outbreaks.
Total Cases	total_cases	Cumulative spread, helps in long-term trend analysis.
Reproduction Rate (R)	reproduction_rate	Average number of secondary cases per infected person. >1 means spreading, <1 means decline.
Cases per Million	total_cases / population * 1,000,000	Normalizes cases for population size. Useful for comparing countries.
7-day Moving Average of New Cases	Rolling average of new_cases	Smooths out daily fluctuations for trend analysis.

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2. Mortality Metrics

These track the severity of the outbreak:

KPI / Metric	Calculation / Notes	Insights
Daily New Deaths	new_deaths	Measures immediate fatal impact.
Total Deaths	total_deaths	Cumulative mortality.
Case Fatality Rate (CFR)	total_deaths / total_cases * 100	% of confirmed cases resulting in death.
Deaths per Million	total_deaths / population * 1,000,000	Normalizes deaths for population size.
7-day Moving Average of New Deaths	Rolling average of new_deaths	Smooth trend analysis for mortality.

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3. Testing Metrics

These measure testing coverage and detection efficiency:

KPI / Metric	Calculation / Notes	Insights
Daily Tests	new_tests	Shows testing activity over time.
Total Tests	total_tests	Measures overall testing scale.
Tests per Million	total_tests / population * 1,000,000	Standardized comparison across countries.
Test Positivity Rate	new_cases / new_tests * 100	High values (>5%) indicate insufficient testing or uncontrolled spread.

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4. Vaccination Metrics

These track the progress of immunization campaigns:

KPI / Metric	Calculation / Notes	Insights
People Vaccinated	people_vaccinated	Total individuals who received at least 1 dose.
People Fully Vaccinated	people_fully_vaccinated	Total individuals fully protected.
Vaccination Coverage %	(people_fully_vaccinated / population) * 100	% of population fully vaccinated.
Daily Vaccinations	new_vaccinations (if available)	Pace of immunization rollout.

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5. Demographic & Health Risk Metrics

These give context on vulnerability and healthcare capacity:

KPI / Metric	Calculation / Notes	Insights
Population Density	population_density	Higher density → higher transmission risk.
Elderly Population %	aged_65_older, aged_70_older	Older populations → higher mortality risk.
Hospital Beds per 1,000	hospital_beds_per_thousand	Healthcare capacity indicator.
Median Age & Life Expectancy	median_age, life_expectancy	Ageing population → higher severe cases.

6. Derived Indicators for Dashboard/Analysis

- **Active Cases** = total_cases - total_deaths - total_recovered (if recovered data exists)
- **Growth Rate of Cases** = (new_cases / previous_day_total_cases) * 100
- **Cumulative Vaccination vs Cases**: correlation to see vaccine impact

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✅ **Priority Focus**:

1. **Spread & Mortality Metrics** – daily cases, deaths, R rate, CFR.
2. **Testing & Vaccination** – positivity rate, vaccination coverage.
3. **Population Risk Context** – elderly %, hospital capacity.