

Country health trends analysis

A study of Global Development Trends



August 21, 2024

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**INTRODUCTION**

This analysis aims to explore key demographic and health indicators -specifically, population size, life expectancy, and fertility rates across various countries and regions.

By leveraging SQL to interrogate the dataset, this study seeks to uncover important patterns, trends, and disparities that shape global and regional population dynamics. The data includes information on individual countries, categorized by regions, allowing for both a granular and comparative analysis.

The exploration is structured around several key objectives:

* understanding the distribution of populations,
* analyzing life expectancy and its determinants,
* examining fertility rates and their implications,
* conducting regional comparisons, and
* deriving actionable insights for policy recommendations.

By the end of this exploration, the analysis will provide a comprehensive understanding of how these demographic variables interact across different contexts, highlighting areas of concern and opportunities for intervention. This study will serve as a foundation for further research and a valuable resource for policymakers aiming to address global and regional demographic challenges.

**Objectives**

1. **Understanding Population Distribution**

The goal is to analyze how populations are distributed across countries and regions, identifying areas of high and low population density.

* Top and Bottom Populations: By ranking countries based on population size, the study will pinpoint the most and least populous nations. This helps in identifying where the largest segments of the world’s population are concentrated, as well as recognizing countries with smaller populations that might face unique demographic challenges.
* Regional Population Averages: Calculating average populations within each region provides a macro-level view of population distribution, highlighting regions with particularly high or low population densities. This can also shed light on regional population imbalances.

1. **Analyzing Life Expectancy**

To explore the variation in life expectancy across different countries and regions, revealing disparities in health outcomes.

* Highest and Lowest Life Expectancy: By ranking countries by life expectancy, the study will identify those with the highest and lowest averages. High life expectancy often correlates with better healthcare, living conditions, and social stability, while low life expectancy may indicate areas needing health interventions.
* Regional Life Expectancy: Understanding the average life expectancy in each region provides insight into regional health disparities. This analysis can help to identify regions where life expectancy is significantly above or below global averages, guiding health policy and resource allocation.

3. **Examining Fertility Rates**

To analyze fertility rates across countries and regions, understanding their impact on population growth and demographic trends.

* Highest and Lowest Fertility Rates: Ranking countries by fertility rate allows us to see where birth rates are highest and lowest. High fertility rates can lead to rapid population growth, which may strain resources, while low fertility rates might indicate declining populations and potential labor shortages.
* Regional Fertility Patterns: By examining fertility rates at the regional level, this study identifies patterns that may be linked to cultural, economic, or policy factors. This helps in understanding regional population growth trends and potential future demographic challenges.
* Relationship with Life Expectancy: Investigating how fertility rates correlate with life expectancy can provide insights into the balance between population growth and health outcomes. For instance, regions with high fertility and low life expectancy might face challenges in healthcare provision and child mortality.

4. **Conducting Regional Comparisons**

To compare demographic and health metrics across different regions, identifying regional disparities and potential causes.

* Comparing Metrics Across Regions: Analyzing how population, life expectancy, and fertility rates differ by region helps in understanding regional characteristics. This can reveal which regions are thriving and which are struggling, guiding targeted interventions.
* Intra-Regional Comparisons: By comparing countries within the same region, you can identify outliers or countries that differ significantly from regional trends. This can highlight successful policies or areas needing improvement.

7. **Deriving Policy Implications and Recommendations**

To use the insights gained from the exploration to inform policy decisions and suggest areas for further research.

* Aggregating Data for Policy Analysis: Summarizing key metrics by region or country provides a foundation for developing informed policy recommendations. For instance, regions with low life expectancy might need increased health funding, while those with high fertility rates might benefit from family planning programs.
* Targeting Interventions: Based on the analysis, you can identify regions or countries that are most in need of intervention. For example, areas with high population growth but low life expectancy may require a combination of healthcare improvements and population management policies.

**DATA PREPARATION**

**Data Cleaning**

The data originally came with 191 rows and 5 columns. It was found that no data was missing, no column/row was duplicated, there were also no record of missing values, but the Population column had a special character (a comma) which made it a vachar instead of an integer.

To resolve this, I used the replace function to remove the comma after which I changed the column from varchar to integer by using the “Alter column” function,

**Definition Of Terms**

1. **Population:**

**Definition:** This column represents the total number of people living in a specific country or region.

**Significance:** Population data is crucial for understanding the size of a country’s or region's inhabitants. It is often used in analyses related to resource allocation, urban planning, and economic development.

1. **Life Expectancy:**

**Definition:** Life expectancy refers to the average number of years a person is expected to live, based on current mortality rates within a specific country or region.

**Significance:** This metric is a key indicator of the overall health and well-being of a population. Higher life expectancy typically reflects better healthcare, living conditions, and access to resources.

1. **Country:**

**Definition:** The country column indicates the specific nation to which the data belongs.

**Significance:** This helps in identifying and categorizing data based on national boundaries. It is essential for comparing metrics across different countries.

1. **Region:**

**Definition:** The region column specifies the geographical area or grouping of countries within a larger continental or subcontinental area.

**Significance**: Grouping by region allows for analysis of broader geographic trends and comparisons within certain parts of the world. Regions can include areas like "Sub-Saharan Africa," "Western Europe," or "Southeast Asia."

**5. Fertility Rate:**

**Definition:** Fertility rate measures the average number of children that would be born to a woman over her lifetime, assuming she experiences the current age-specific fertility rates throughout her life.

**Significance:** Fertility rate is an important demographic indicator, as it influences population growth and age structure. It can reflect cultural, economic, and social factors influencing family size within a population.

ANALYSIS

1. **The 10 least populated countries:**

**Query:**

select country, population

from health

order by population asc

limit 10;

1. **The 10 most populated countries:**

**Query:**

select country, round (population, 2)

from health

order by population DESC

limit 10;

|  |  |
| --- | --- |
| country | population |
| China | 1269974572 |
| India | 1053481072 |
| United States | 282895741 |
| Indonesia | 211540428 |
| Brazil | 175786441 |
| Russia | 146400951 |
| Pakistan | 138250487 |
| Bangladesh | 131280739 |
| Japan | 125714674 |
| Nigeria | 122876723 |

1. **Total population by region**

**Query:**

select region, sum(population) as total population

from health

group by region;

1. **Countries with the highest life expectancy**

**Query:**

select country, lifeexpectancy

from health

order by lifeexpectancy desc

limit 10;

|  |  |
| --- | --- |
| country | life expectancy |
| Hong Kong, China | 82.663 |
| Japan | 81.1 |
| Martinique | 80.475 |
| Switzerland | 80 |
| Iceland | 79.9 |
| Guadeloupe | 79.848 |
| Channel Islands | 79.745 |
| Malta | 79.7 |
| Australia | 79.7 |
| Sweden | 79.7 |

1. **Countries with the lowest life expectancy**

**Query:**

select country, lifeexpectancy

from health

order by lifeexpectancy asc

limit 10;

|  |  |
| --- | --- |
| country | lifeexpectancy |
| Zambia | 45.7 |
| Malawi | 46.3 |
| Burundi | 47.5 |
| Swaziland | 48.7 |
| Eritrea | 49.3 |
| Lesotho | 49.8 |
| Rwanda | 50 |
| Uganda | 50 |
| Zimbabwe | 50.8 |
| Afghanistan | 51 |

1. **Average life expectancy by region**

**Query:**

select region, avg(lifeexpectancy) as AVG\_life\_expectancy

from health

group by region

order by AVG\_life\_expectancy desc;

1. **Countries with the highest fertility rate**

**Query:**

select country, fertilityrate

from health

order by fertilityrate desc

limit 10;

|  |  |
| --- | --- |
| country | fertilityrate |
| Afghanistan | 7.81 |
| Niger | 7.74 |
| Somalia | 7.65 |
| Chad | 7.38 |
| Congo, Dem. Rep. | 7.14 |
| Burundi | 7.11 |
| Timor-Leste | 7.08 |
| Uganda | 6.9 |
| Angola | 6.88 |
| Mali | 6.85 |

1. **Countries with the lowest fertility rate**

**Query:**

select country, fertilityrate

from health

order by fertilityrate asc

limit 10;

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| |  |  |  | | --- | --- | --- | | Country | Fertilityrate | | | Hong Kong, China | 0.88 | | Macao, China | 1 | | Ukraine | 1.16 | | Russia | 1.16 | | Latvia | 1.17 | | Bulgaria | 1.18 | | Italy | 1.21 | | Spain | 1.21 | | Slovenia | 1.22 | | Belarus | 1.25 | |  |  | | | |  |
| 1. **Average fertility by region**   **Query:**  select region, avg(fertilityrate) as average\_fertility\_rate  from health  group by region; | | |  |
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| 1. **Countries with high Population and low expectancy rate**   **Query:**  select country, population, lifeexpectancy  from health  where population > (select avg(population) from health) and lifeexpectancy  < (select avg(lifeexpectancy) from health);   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  | | --- | --- | --- | | country | Population | Lifeexpectancy | | Bangladesh | 131280739 | 65.8 | | Congo, Dem. Rep. | 48048664 | 52.5 | | Ethiopia | 66443603 | 52.5 | | India | 1053481072 | 61.1 | | Indonesia | 211540428 | 68.3 | | Myanmar | 47669791 | 61.4 | | Nigeria | 122876723 | 55.8 | | Pakistan | 138250487 | 62.6 | | Russia | 146400951 | 65.4 | | South Africa | 44896856 | 57.1 | | Tanzania | 33991590 | 54.8 | | Ukraine | 48746269 | 67.5 | |  |  | |  |  |  | |  |  |  | | | |  |
| **Findings and discussions** | | |  |

Based on the SQL data exploration, several key insights were be derived from the data:

**1. Population Distribution Across Regions:**

* Population Concentrations: The Asia regions have significantly higher populations than others, indicating a concentration of people in these areas. This may point to urbanization, economic opportunities, or favorable living conditions in those regions.
* Regional Disparities: The data reveal substantial disparities in population sizes between different regions, potentially highlighting Africa as more rural or less developed.

**2. Life Expectancy Trends:**

* High vs. Low Life Expectancy Regions: Some regions like: Europe & Central Asia, America, Middle East & North Africa, East Asia & Pacific have higher average life expectancies, which may correlate with better healthcare systems, higher standards of living, or healthier lifestyles. Conversely, regions with lower life expectancy like Sub-Saharan Africa could be facing challenges such as inadequate healthcare, poor nutrition, or socioeconomic issues.

**3. Fertility Rate Patterns:**

* Fertility Rate Variations: The exploration uncovers East Asia, Sub-Saharan Africa and South Asia as regions with higher fertility rates, possibly due to cultural, religious, or economic factors that encourage larger families. Regions with lower fertility rates like America and Europe might be experiencing trends typical of more developed areas, such as delayed childbearing, higher education levels among women, or access to family planning.

**4. Correlations Between Metrics:**

* Population vs. Life Expectancy: Regions with higher populations might not always have higher life expectancy, suggesting that large populations don't necessarily correlate with better living conditions. Conversely, regions with smaller populations could have higher life expectancy, possibly indicating more equitable distribution of resources or better healthcare access.
* Outliers: Some countries might stand out as outliers where, despite a large population, life expectancy is high, potentially due to efficient healthcare systems and strong economies.
* Population vs. Fertility Rate: Typically, as regions become more developed, fertility rates tend to decrease, often resulting in a slower population growth rate. This trend is usually due to factors like improved access to education, particularly for women, better access to contraception, and shifts in social norms regarding family size. However, factors like migration can alter this trend like we have in our data set above.
* High Fertility in Low Population Regions: In less developed regions, higher fertility rates might lead to rapid population growth, which could strain resources and public services, potentially leading to challenges in sustaining a high quality of life thereby leading to low population growth.

**Life Expectancy vs. Fertility Rate:**

* Inverse Relationship: Generally, regions with higher life expectancy tend to have lower fertility rates. This is often because higher life expectancy is associated with better healthcare and education systems, which in turn often lead to smaller family sizes.
* Development Indicator: This inverse relationship can be a strong indicator of a region's stage of development. For instance, developed countries typically exhibit higher life expectancy and lower fertility rates, while developing countries may display the opposite pattern.

**Recommendations**

Based on the insights derived from the exploration of the dataset, here are some recommendations:

1**. Strengthen Healthcare Systems in Low Life Expectancy Regions:**

Governments and international organizations should invest in improving healthcare infrastructure, access to medical services, and public health initiatives in regions with low life expectancy.

2**. Promote Education, Especially for Women:**

Recommendation: Focus on increasing access to education, particularly for women, in regions with high fertility rates.

**3. Implement Family Planning and Reproductive Health Programs:**

Recommendation: Expand family planning services and reproductive health education in regions with high fertility rates.

**4. Encourage Economic Development in Underdeveloped Regions:**

Recommendation: Invest in economic development initiatives, such as job creation, infrastructure development, and poverty reduction programs in regions with large populations and low life expectancy.

**5. Focus on Environmental Health Initiatives:**

Prioritize environmental health initiatives in regions where life expectancy is low due to environmental factors like pollution, poor sanitation, or inadequate access to clean water.

**6. Develop Urban Planning and Resource Management Strategies:**

In regions with rapidly growing populations, develop comprehensive urban planning and resource management strategies to ensure sustainable development.

**Suggestions for further studies**

Based on the exploration and analysis of your dataset, here are some suggestions for future studies:

1. Longitudinal Analysis of Demographic Trends

2. Impact of Economic Development on Demographic Metrics

3. Regional Health Interventions and Their Effects

4. Socio-Cultural Factors and Fertility Rates

5. Migration Patterns and Their Impact on Demographic Metrics:

6. Gender-Specific Analysis

7. Environmental Factors and Life Expectancy

8. Urban vs. Rural Disparities

9. Education and Its Impact on Demographic Metrics:

10. Predictive Modeling of Future Demographic Changes: