

# Exploring World Happiness: Between the Shadows of 2020 to the Dawn of 2023

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## Introduction:

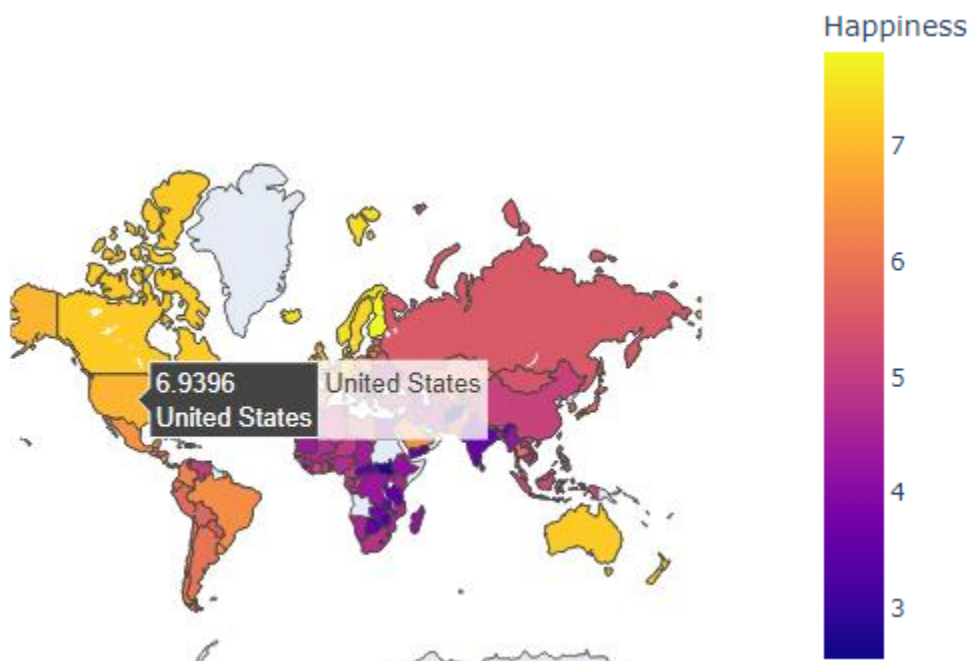
The COVID-19 pandemic cast a long shadow over the world in 2020, affecting lives, economies, and well-being on a global scale. As we navigate through the challenges and uncertainties, the lens of world happiness provides a unique perspective on how societies coped during these turbulent times.

This comprehensive data set provides a wealth of information about countries worldwide, encompassing a wide range of indicators and attributes. This dataset offers a complete global perspective on various aspects of nations. We will delve into the data to extract insights, perform exploratory data analysis (EDA), and draw meaningful conclusions.

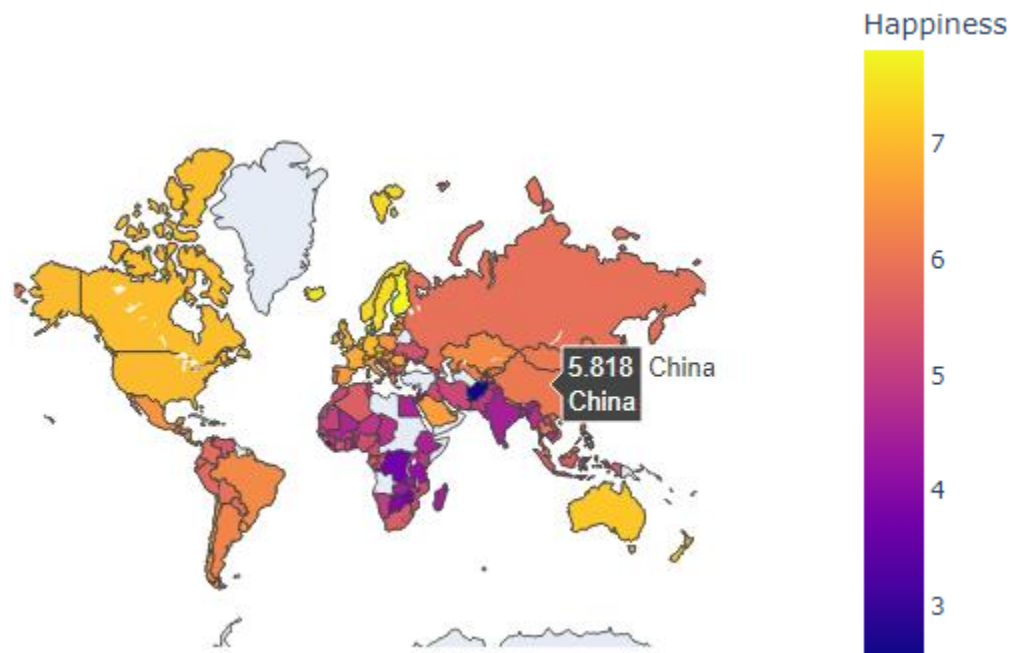
## Maps:

Below are two screenshot of the interactive map illustrating the Happiness Index for different countries in the year 2020 and 2023. The map uses colors to represent the happiness scores, with darker shades indicating higher scores. As you hover over a country on the map, it reveals the country's name and its corresponding happiness score. this map provides a dynamic and visual way to explore and compare the happiness levels across various countries during the specified year.

Happiness Index 2020

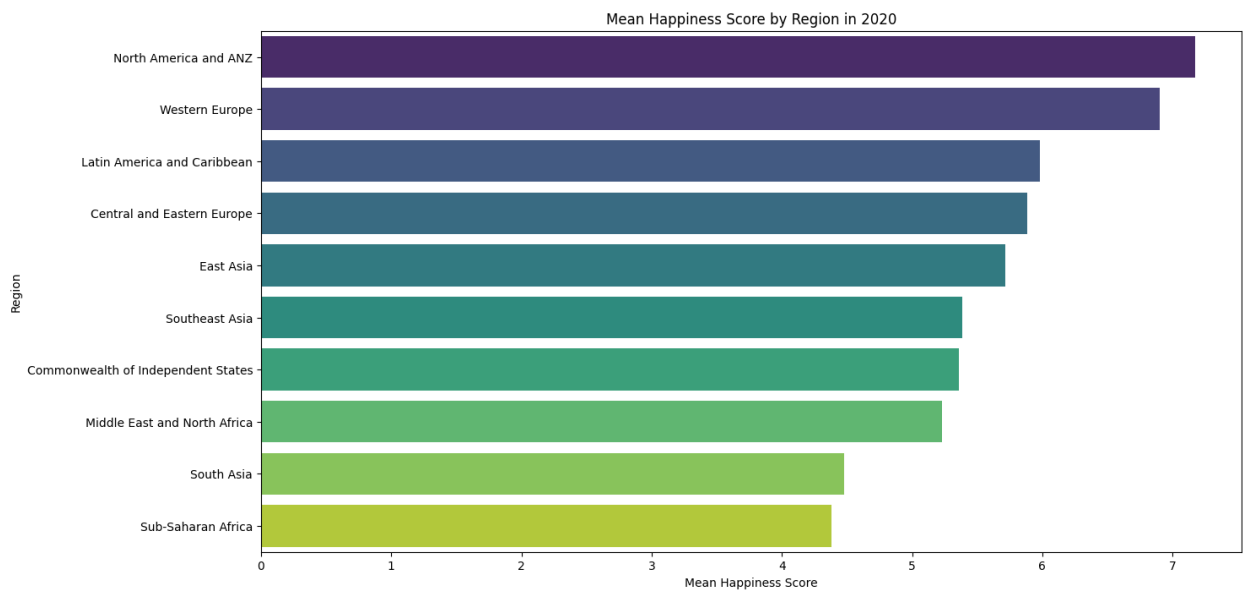


Happiness Index 2023



2020: A Snapshot of Happiness:

In the year 2020, the global happiness landscape showcased a diverse range of nations, each grappling with the unprecedented challenges posed by the COVID-19 pandemic.

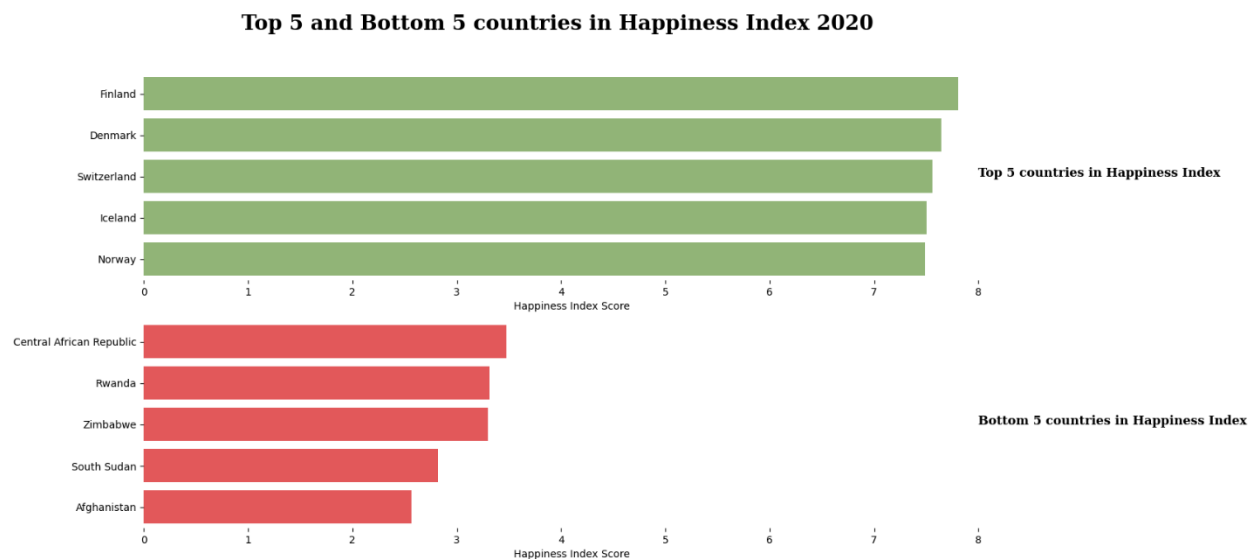


North America and ANZ (Australia and New Zealand) have the highest mean happiness score, indicating that countries in this region generally report higher levels of subjective well-being and life satisfaction.

Sub-Saharan Africa has the lowest mean happiness score among the regions shown, indicating that countries in this region face significant challenges in providing adequate living standards, opportunities, and quality of life for their populations.

Question to consider: What factors might contribute to North America and ANZ having the highest mean happiness score compared to other regions in 2020?

There is a clear trend of higher mean happiness scores in more economically developed regions (North America, Western Europe) and lower scores in less developed or developing regions (Sub-Saharan Africa, South Asia), highlighting the potential influence of economic factors on subjective well-being measures. The GDP indicating greater economic prosperity as North America and ANZ has a average of 10.6 and Sub-Saharan has 7.3.

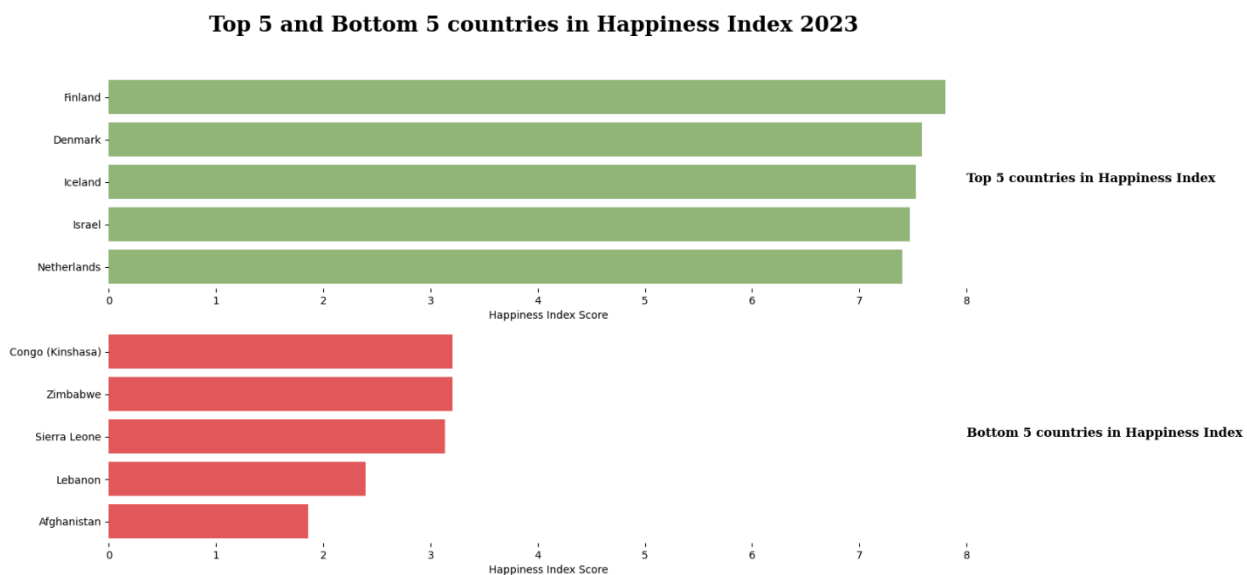


Consistency in Top 5: The top countries demonstrated consistency in maintaining well-being, emphasizing economic stability, robust social support, and health-focused policies.

Ongoing Struggles: Bottom countries faced persistent challenges, signaling the need for targeted interventions and comprehensive well-being initiatives.

## 2023: The Dawn of Transformation

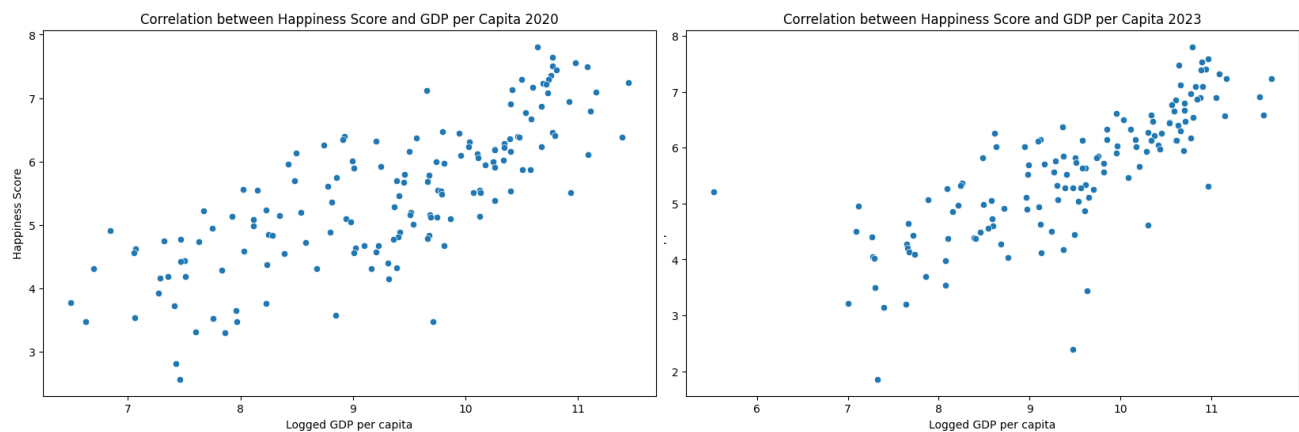
Fast forward to 2023, the world witnessed a transformative journey. As nations adapted to the challenges of the pandemic, the happiness landscape underwent notable changes.



Consistency in Leadership: Top countries demonstrated consistent well-being, maintaining their positions, and showcasing the enduring impact of factors contributing to happiness. New Dynamics: Changes in the bottom 5, with Sierra Leone entering, highlighted evolving challenges and the emergence of new struggles in the pursuit of happiness.

**Correlation between Happiness Score and GDP per Capita**

In 2020, the scatterplot reveals a diverse landscape where the happiness score and GDP per capita share an intricate relationship. Countries with higher GDP per capita tend to exhibit higher happiness scores.



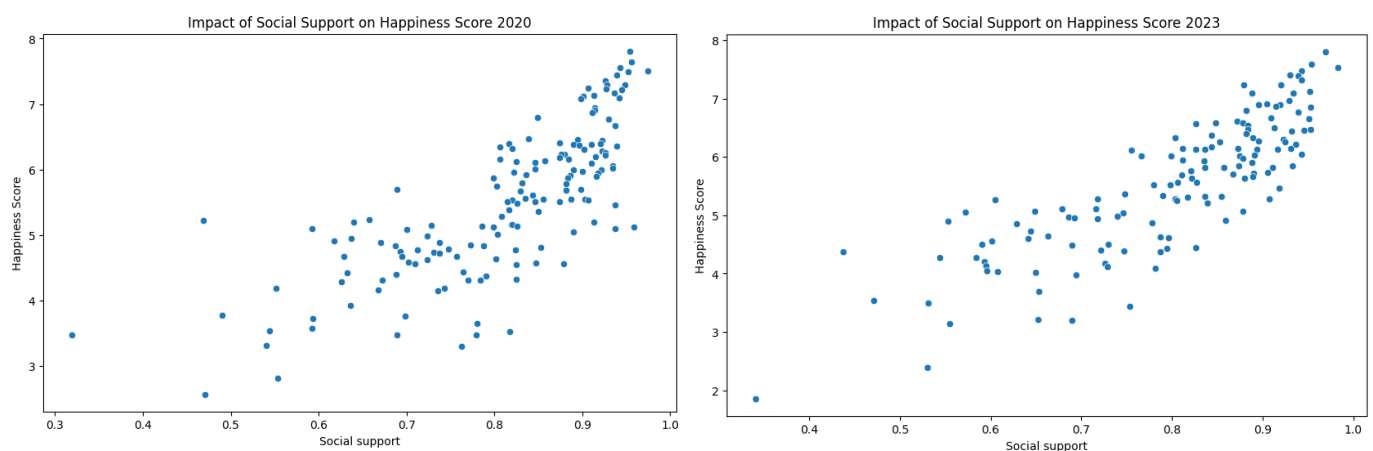
Data Points (Blue Dots): Each blue dot represents a country.

Question to consider: Moving to 2023, what changes or similarities emerge in the correlation between happiness scores and GDP per capita?

Insight: Despite the pandemic, the positive correlation between GDPs per capita Happiness Score persists. As GDP per capita increases, the Happiness Score tends to rise as well. Some countries managed to maintain or even improve their happiness levels during the pandemic. The mean Logged GDP per capita increased from 9.296 in 2020 to 9.450 in 2023, reflecting economic growth. Factors like social support, community resilience, and effective crisis management played a crucial role.

### Impact of Social Support on Happiness Score

The 2020 scatterplot portraying the relationship between social support and happiness offers a poignant narrative. As expected, countries with stronger social support structures tend to foster higher happiness scores.

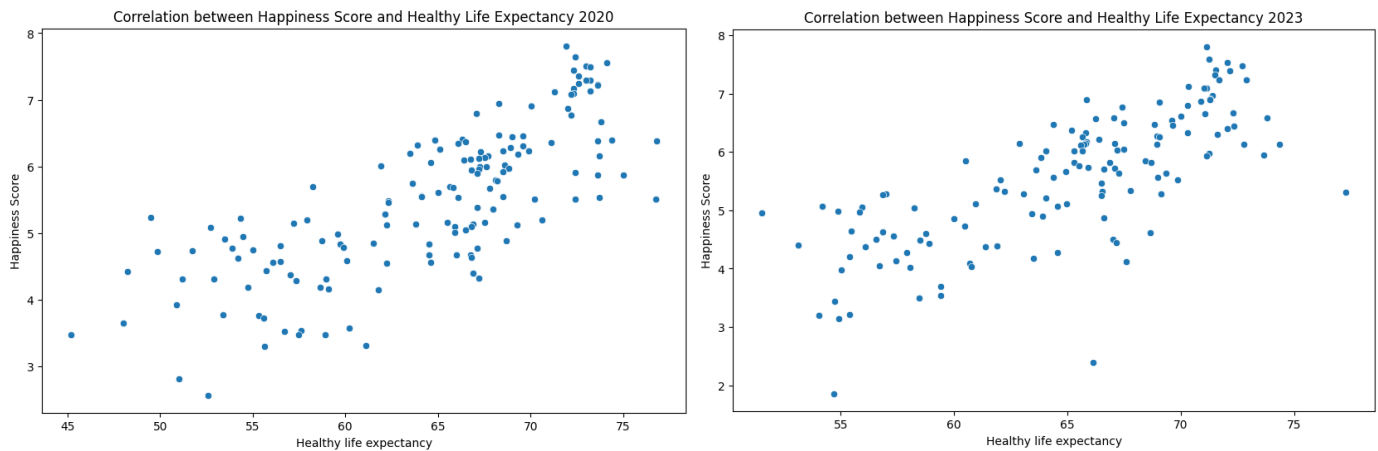


Insights: Both in 2020 and 2023, there exists a positive correlation between social support and happiness scores. As social support increases, people tend to report higher levels of happiness. This reaffirms the importance of strong social networks and community bonds in fostering well-being. Despite the disruptive effects of the COVID-19 pandemic, countries that prioritize social connections and support systems demonstrate resilience even during difficult times. However, the mean Social Support decreased slightly from 0.809 in 2020 to 0.799 in 2023, indicating a marginal decline in perceived social support. Prioritizing social well-being alongside economic growth leads to more resilient and happier societies.

### Correlation between Happiness Score and Healthy Life Expectancy

The correlation between happiness and healthy life expectancy in 2020 paints a picture of well-being closely tied to health. Nations with longer life expectancies tend to witness higher

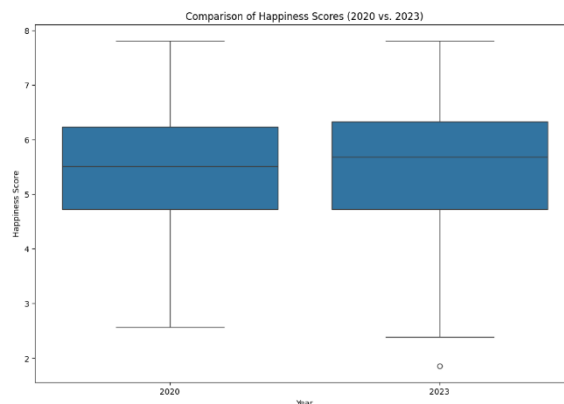
happiness scores. As we transition to 2023, does the narrative persist, or have new nuances emerged in the relationship between happiness and healthy life expectancy?

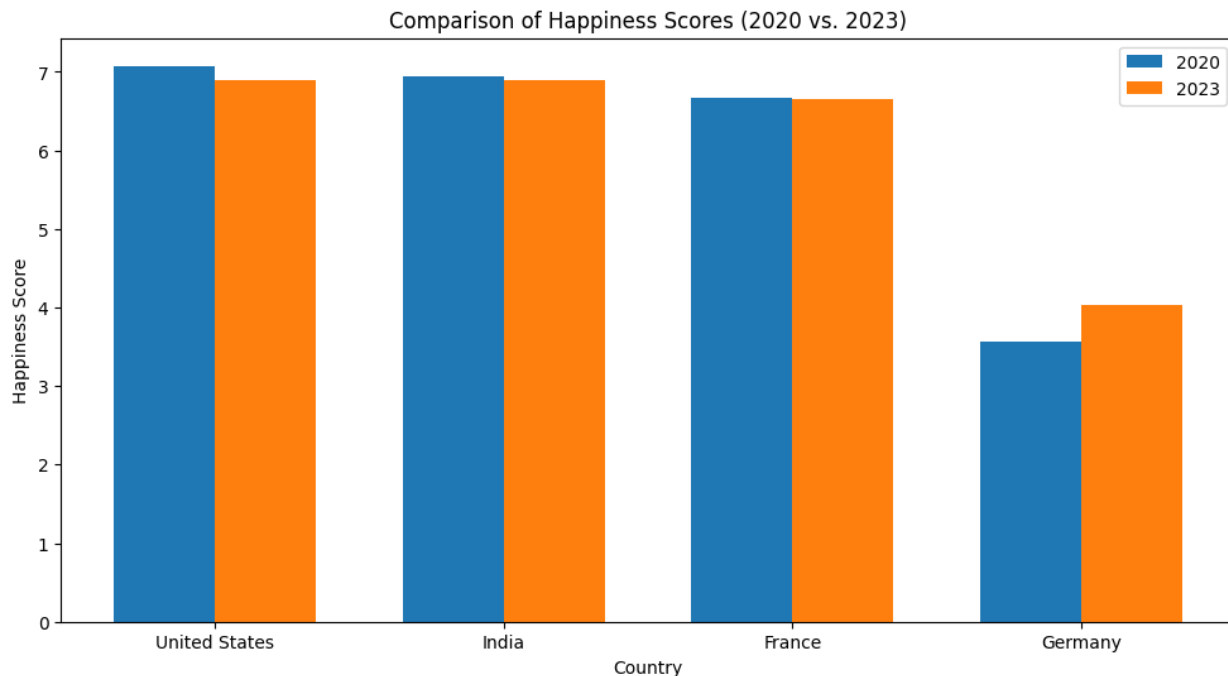


In 2020, countries with higher healthy life expectancy tended to report greater happiness. The trend persists into 2023: as healthy life expectancy increases, so does happiness. Some data points shifted, suggesting adaptive responses to external events. The mean Healthy Life Expectancy remained relatively stable, indicating that, on average, people can expect a similar level of health and life satisfaction. In 2020, the mean is 64.45 and in 2023 the mean is 64.97-year-old.

### Comparison of Happiness Score (2020 vs. 2023)

Despite the global pandemic, the happiness scores for both years remain almost identical. This suggests that people's overall well-being and contentment did not significantly fluctuate during this period. However, did happiness scores in countries highly affected by COVID-19 show a significant change between 2020 and 2023? I've selected four most affected countries during covid-19, United, India, France, and Germany.





Germany experienced an increase in happiness scores from 2020 to 2023, suggesting an improvement in overall well-being. In contrast, the United States, India, and France exhibited relatively stable happiness scores between 2020 and 2023, with minimal changes observed for these nations.

The overall stability of happiness scores may have been mitigated by various social, economic, and policy factors specific to each nation; Uneven economic and social recovery, with vulnerable groups left behind, could prevent overall national happiness from rebounding fully; the pandemic caused job losses, business closures, supply chain issues, and economic recessions in many nations, which can decrease financial security and life satisfaction etc.

### Quantifying Changes - Percentage Change Analysis

As we transition from 2020 to 2023, quantifying changes in happiness scores provides a deeper understanding. Let's examine the top 5 positive changes and the top 5 negative changes.

#### Top 5 Positive Changes:

1. Afghanistan (124.08% Increase): Afghanistan experienced a significant positive change, indicating a substantial improvement in the subjective well-being of its population.
2. Lebanon (75.01% Increase): Lebanon witnessed a substantial increase in the Ladder score, suggesting positive developments in factors contributing to overall happiness.
3. Congo (34.33% Increase): Congo saw a notable improvement in well-being, reflecting positive changes in various aspects of life.

4. Zimbabwe (33.85% Increase): Zimbabwe recorded a considerable increase in the Ladder score, indicating a significant boost in overall happiness and life satisfaction.
5. Sierra Leone (33.44% Increase): Sierra Leone experienced a notable positive change in well-being, possibly driven by improvements in economic, social, and health factors.

#### Top 5 Negative Changes:

1. Singapore (-1.998% Decrease): Singapore showed a slight decline in the Ladder score, suggesting a marginal reduction in overall happiness.
2. United Arab Emirates (-1.992% Decrease): The United Arab Emirates experienced a small negative change in well-being.
3. Taiwan Province of China (-1.966% Decrease): Taiwan Province of China saw a modest decrease in the Ladder score.
4. Romania (-1.882% Decrease): Romania exhibited a negative change in well-being.
5. Colombia (-1.490% Decrease): Colombia experienced a moderate decrease in the Ladder score.

### Statistical Significance - T-test Results

Statistical significance underpins our findings. A t-test for the happiness score unveils the quantitative evidence supporting or refuting changes between 2020 and 2023. Question to consider: What do the t-test results for the happiness score reveal about the statistical significance of changes from 2020 to 2023?

T-test results for Ladder score:

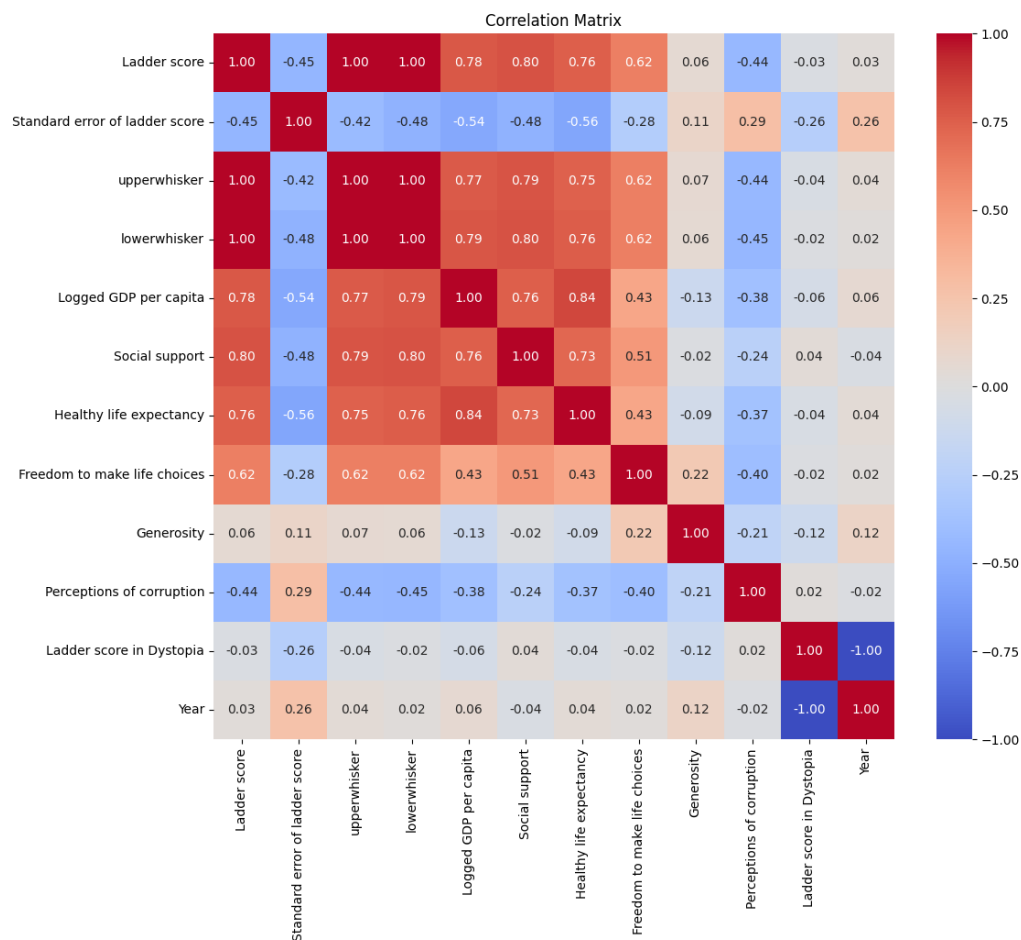
- T-statistic: -0.5027818529657384
- P-value: 0.6155019074617754

The t-test results indicate that, based on the provided data, there is not a statistically significant difference in the mean happiness scores between the two time periods (2020 and 2023). The negative t-statistic suggests a slight decrease in mean happiness scores from the first dataset to the second, but this difference is not considered statistically significant given the high p-value.

### Understanding Relationships - Correlation Matrix Heatmap



The correlation matrix heatmap encapsulates the intricate relationships between key variables. Explore the correlations among happiness, GDP per capita, social support, healthy life expectancy, and freedom. Questions to consider: How does the correlation matrix heatmap provide a comprehensive view of relationships between key variables?



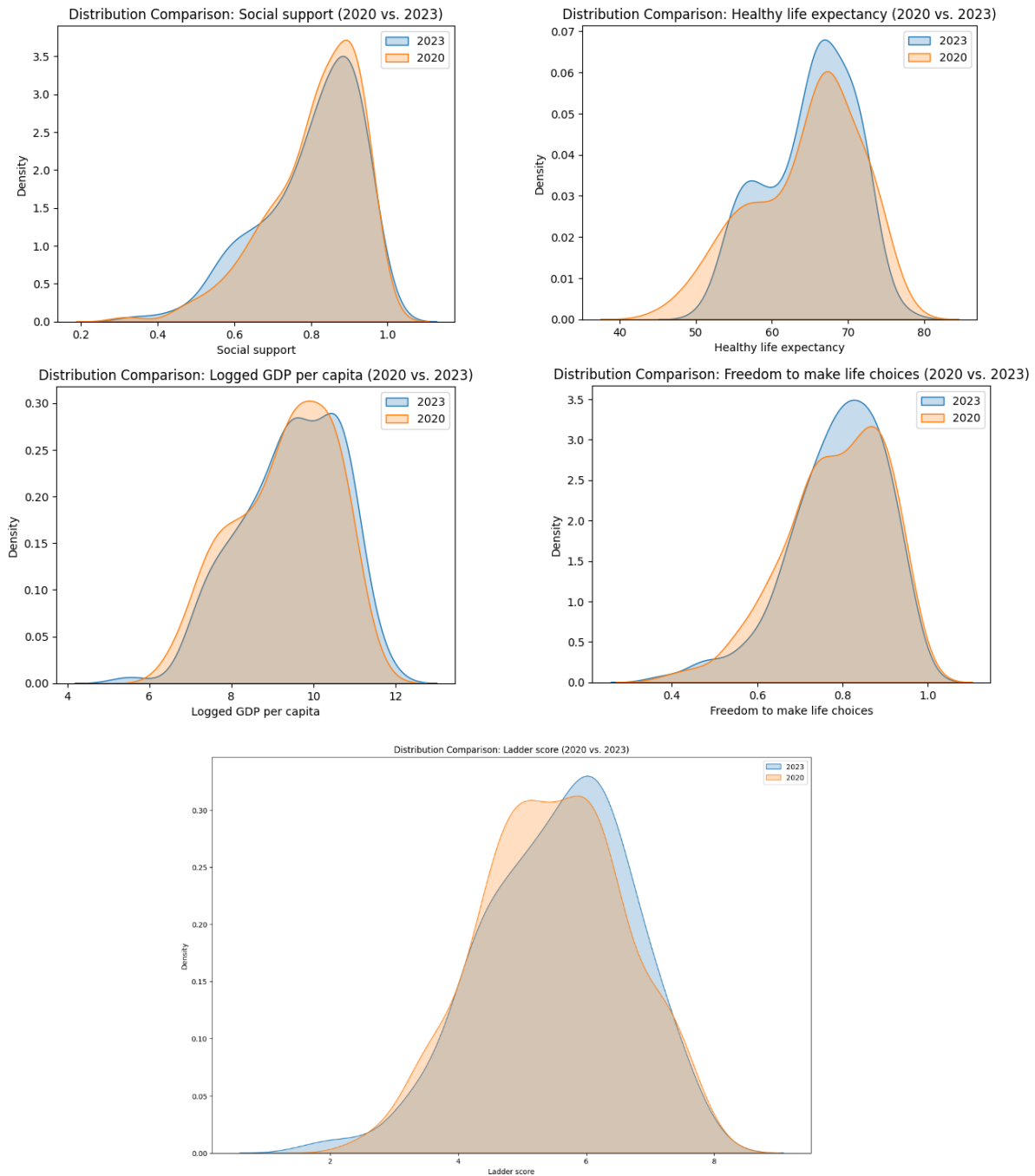
This correlation matrix heatmap provides insights into the relationships between various factors and the overall happiness score.

Ladder score (overall happiness) has a strong positive correlation with factors like GDP per capita, social support, healthy life expectancy, freedom to make life choices, and the upper and lower bounds of the whisker plot ranges for happiness. This suggests that higher income levels, strong social support systems, better health outcomes, and personal freedoms are associated with greater overall happiness.

Perceptions of corruption have a moderately negative correlation with the happiness score, indicating that higher perceived corruption levels tend to correspond with lower reported happiness.

## Distribution Comparison - Kernel Density Plots

Our exploration concludes with a visual feast of distribution comparisons. Kernel density plots shed light on how key variables have evolved from 2020 to 2023. Here are more visuals for your reference.



## Conclusion:

In our journey from the shadows of 2020 to the dawn of 2023, the pervasive influence of the COVID-19 pandemic has shaped the narrative of global well-being. The pandemic's impact is

evident in nations' adaptive responses and the transformation of key factors influencing happiness.

As we explored correlations between GDPs per capita, social support, health, and freedom with happiness scores, the adaptive responses to the challenges posed by COVID-19 became apparent. Nations showcased resilience in the face of adversity, with some recovering and thriving.

Quantifying changes in happiness scores highlighted positive and negative shifts, revealing the complex interplay of factors amidst the pandemic's uncertainties. The pandemic's multifaceted consequences influenced the interconnected dynamics of economic prosperity, social connections, health, and freedom.

The statistical significance, measured through t-tests, adds a layer of evidence to our findings, grounding them in the context of a global health crisis. Our exploration underscores the collective resilience of nations in navigating the challenges of the COVID-19 era.