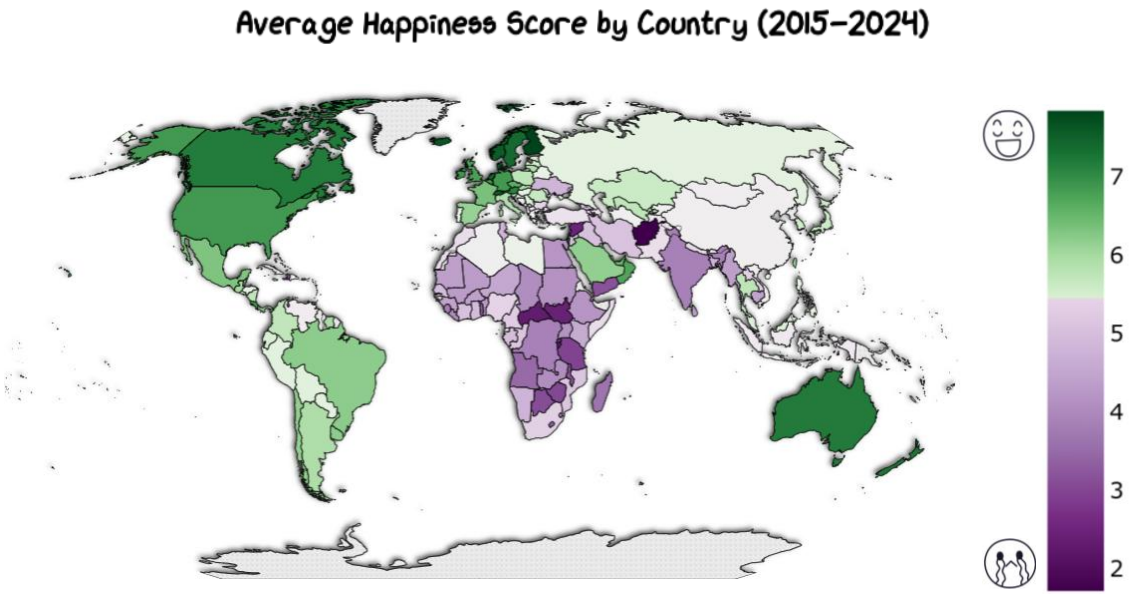
World Happiness 2015-2024: Drivers, Stories, and Regional Trends



Data Visualization Pitch

Student Individual Assignment

Student name: **Matteo Fumagalli**
Student ID: **894468**
Student e-mail address:
m.fumagalli139@campus.unimib.it

Research questions

This project aims to understand global happiness trends over the last decade, highlighting the main drivers, regional dynamics, and differences between the happiest and least happy countries.

Therefore, the main research questions can be grouped into three areas:

- **Global trends and key drivers**
  * How have global happiness levels evolved from 2015 to 2024?
  * Which factors show the strongest correlation with the overall happiness score?

- **European happiness situation**
  * How has the European happiness landscape changed over the last decade (2015-2024)?

- **Regional dynamics and inequalities**
  * How have happiness levels evolved across different world regions over time? Are regional positions relatively stable, or do they shift significantly over time?
  * How has the regional gap evolved, and how do top-performing and bottom-performing regions differ in terms of key happiness drivers?

About Data

Data search challenges: to answer the several research questions previously explained, a comprehensive, multi-year, and multi-country dataset was needed, featuring comparable happiness indicators and quantitative variables suitable for detailed analysis and visualization. The original raw data from the World Happiness Report (WHR), collected via the Gallup World Pool and published by the Sustainable Development Solutions Network (SDSN) of United Nations in collaboration with the Wellbeing Research Centre of Oxford University, is not fully publicly released. Moreover, official available tables often present missing indicators for specific countries in certain years, posing a challenge for longitudinal analysis.

Chosen dataset and licence: the selected dataset is Kaggle's «World Happiness 2015-2024» (https://www.kaggle.com/datasets/yadiraespinoza/world-happiness-2015-2024/data), which consolidates the last ten annual reports (2015-2024) into a consistent structure, ensuring the availability of happiness scores and key explanatory variables for multiple countries across the decade. It is shared under CC0 (Public Domain) licence, permitting unrestricted use for academic and commercial purposes, including possible modification, transformation, and redistribution.

Quality and completeness considerations: potential data limitations, addressed during the processing phase, include missing or inconsistent regional classifications, limited or unstable sample coverage for some countries, and erroneous patterns in certain variables.

Methodology

Data collection: the dataset was manually downloaded from Kaggle, and no additional techniques were required, as it already contained all the necessary information for the relevant years.

Data processing and cleaning: all operations were performed in Python, leveraging key libraries, such as pandas for data manipulation, numpy for numerical operations, seaborn and matplotlib for static visualizations, plotly for interactive visualizations, os for file system access, re for regular expressions, and country_converter for harmonizing country, region, and continent names. Specifically, the main processing and cleaning steps included the conversion of numeric columns to the correct types, the correction of inconsistent country names, the standardization of countries (ISO 3166-1 alpha-3 codes), regions, and continents based on the United Nations codification, the removal of non-official entities mapped to the same standardized country, the handling of missing GDP per capita values, the interpolation between previous and subsequent year data to fix distorted GDP per capita or social support values in specific years (2016 and 2018).

Processed dataset structure: the final dataset includes geographic information (country standardized, country iso3, region standardized, continent), temporal indication (year, ranking), outcome variable (happiness score), and explanatory variables (GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, perceptions of corruption).

Data transformation: the main transformation tasks include the calculation of aggregated measures for exploration and initial findings, as well as the creation of new categorical variables, as explained before, for comparative analysis.

Analytical techniques: to derive meaningful insights, the initial analysis required descriptive statistics and measures of central tendency for baseline understanding about countries and regions tracked. Moreover, trend analysis of happiness over time at different aggregation levels represents the core part of the project, in combination with the use of comparative analysis between regions and countries. Ultimately, correlation analysis was also used to evaluate the contribution of each explanatory factor to the overall happiness score.

Visualization tools: static plots and interactive charts were developed using the Python programming language, whereas maps were created through the Flourish platform.

Colour palette: all visualizations use a ColorBrewer diverging palette (https://colorbrewer2.org/?type=diverging&scheme=PRGn&n=10), selected for its colourblind-safety and clear representation of geographical data.

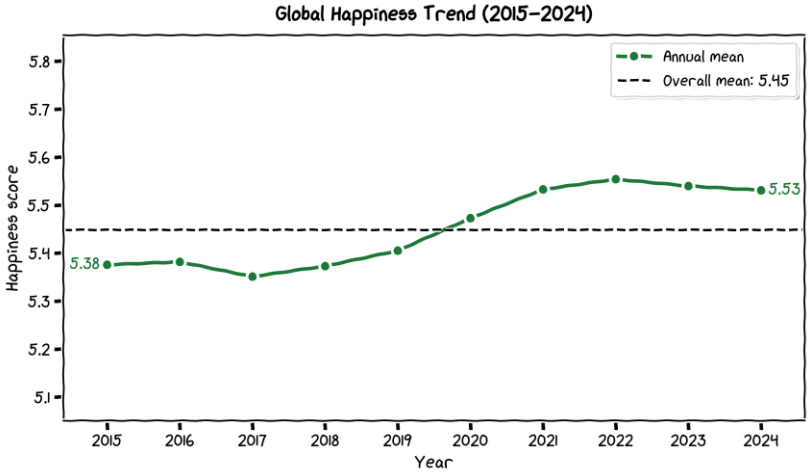
Code documentation: proper library documentation and online examples guided the visualization development, especially for interactive plots (https://plotly.com/python/).

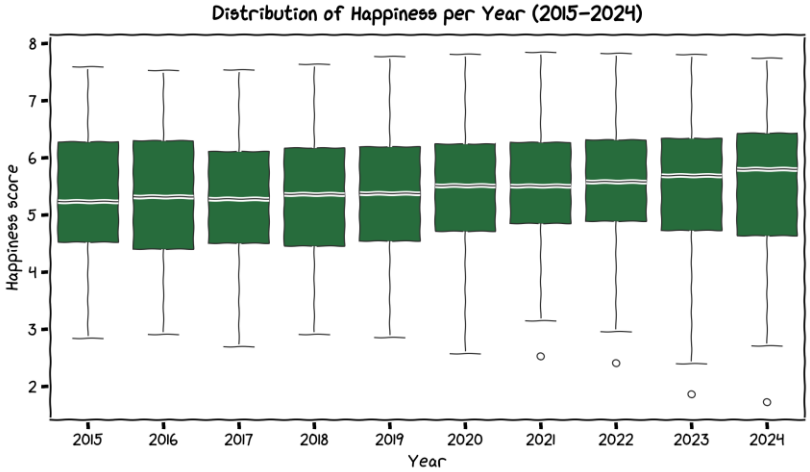
Reproducibility: all steps are fully reproducible using the publicly available Kaggle dataset and the Jupyter notebook shared on GitHub (https://github.com/MatteoFumagalli/msc-data-science/tree/main/projects/data-visualization).

Insights from the data

Before presenting some journalistic stories, the following are the main patterns hidden in a decade, from 2015 to 2024, of global happiness data:

- Global happiness has increased over the last decade, rising from an annual mean of 5.38 points in 2015 to 5.53 points in 2024, on a scale from 0 to 10. The overall decade mean of 5.45 points was surpassed around 2019.
- The distribution of happiness scores remains relatively stable over time, with the median score consistently close to the overall mean, despite minor annual fluctuations in the score range.
- Social support, healthy life expectancy, and GDP per capita show the strongest positive correlation with the overall happiness score, considering a Pearson correlation coefficient greater than 0.6, on a scale from -1 to 1.
- Australia and New Zealand, Western Europe, Northern America, and Northern Europe are consistently the happiest regions over the decade, with scores significantly higher than the overall mean. In contrast, different regions of Africa are typically ranked among the least happy in the world, with scores substantially below the overall mean.
- Top-performing regions demonstrate considerably higher scores across all key explanatory drivers, compared to middle and bottom regions.

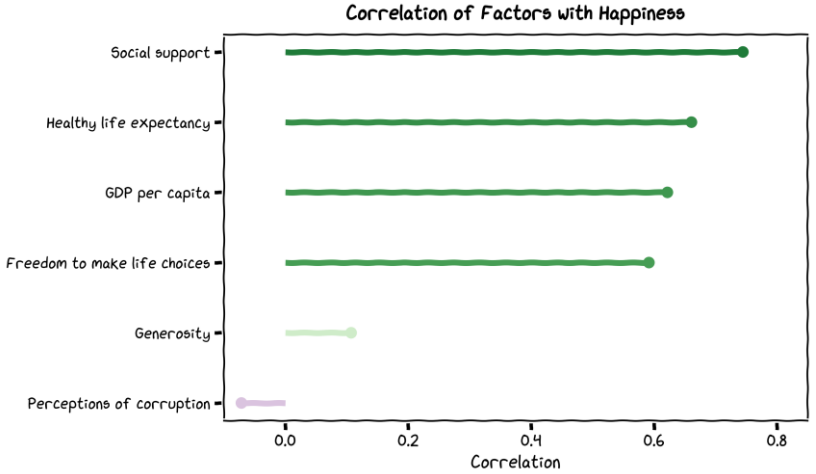


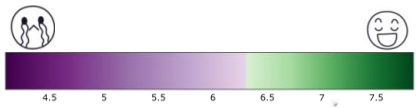


Global trends: are we happier than 10 years ago? In a world reshaped by multiple crisis, such as global pandemic, political instability, persistent inflation, and mounting climate anxiety, it would be reasonable to assume that the global happiness has sharply declined over the past decade. However, the data tells a partially optimistic story. After years of stagnation and a modest dip, global happiness appears to be recovering slowly. The annual mean happiness score increased from 5.38 in 2015 to 5.53 in 2024, considering a 0-10 scale, crossing the long-term global average in 2019 and staying above that benchmark thereafter. Actually, this upward trend masks a deeper and more troubling reality. A closer look at the yearly distribution of scores reveals that gains in average happiness are not evenly shared. While some countries continue to grow happier, others are falling further behind. The gap between the world's happiest and least happy nations is now wider than ever, suggesting that recent geopolitical shocks and economic pressures have intensified existing global inequalities.

Key drivers: what makes the world happier?

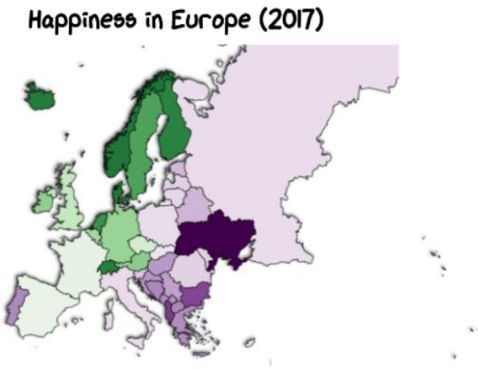
The data helps settle a long-standing debate: while economic resources are clearly foundations for well-being, human connections and health emerge as the most powerful engines of global happiness. The analysis of the key drivers reveals that social support, healthy life expectancy, and GDP per capita form the three pillars of well-being. Each of these factors displays a strong positive correlation with the happiness score, considering coefficients that reach 0.6 or above. By contrast, other commonly cited contributors, such as generosity or perceptions of corruption, appear to play a much smaller, and in some cases nearly negligible, role in explaining cross-country differences in happiness. These findings point to a crucial challenge for policymakers. If the recent upward trend in global happiness is to be sustained, policy efforts must extend beyond economic growth alone and place greater emphasis on strengthening social support systems and enhancing population health.

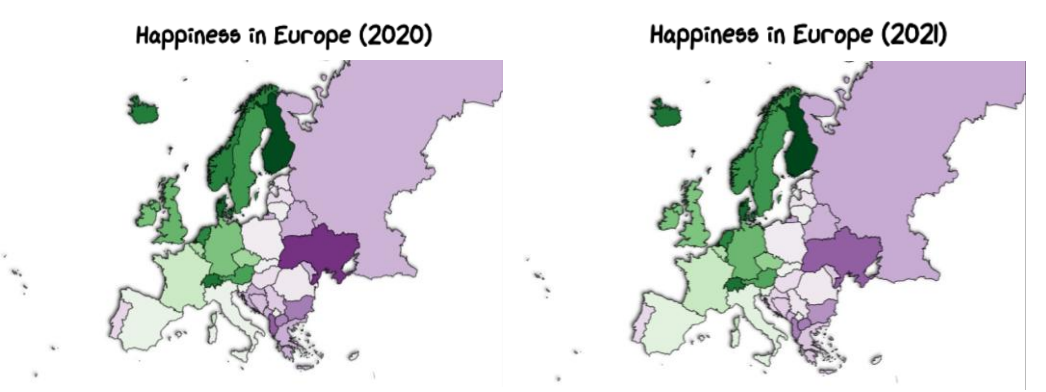


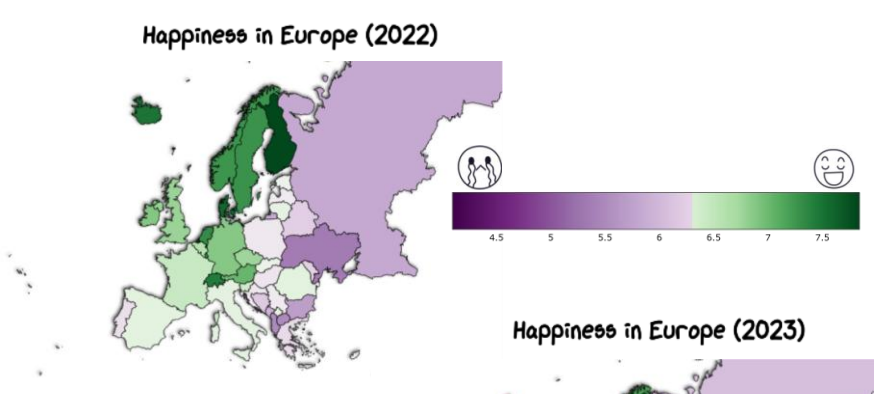


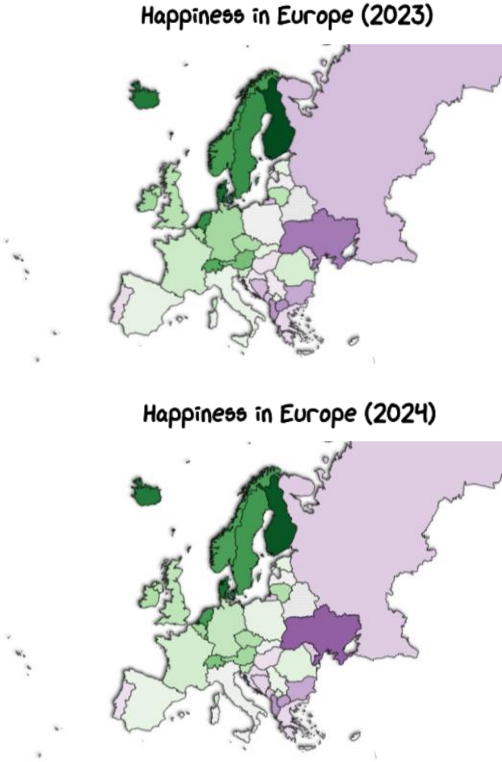
European happiness landscape: how has it evolved during the past decade?

Europe, often viewed as a global benchmark for welfare and stability, presents a dual story of happiness. On one side, Northern Europe, consistently led by Finland, Denmark, and Iceland, has become almost synonymous with happiness. These countries regularly score above 7.5 points, solidifying their position as global leaders in well-being and significantly outperforming the European mean of 6.29 points. Their success is rooted in strong public services, accessible welfare systems, including healthcare and education, high levels of institutional trust, and a pronounced emphasis on work-life balance. On the other side, Eastern Europe continues to face structural challenges. Many countries remain 1-2 points below the European average, reflecting weaker public institutions, lower income levels, and prolonged political instability.

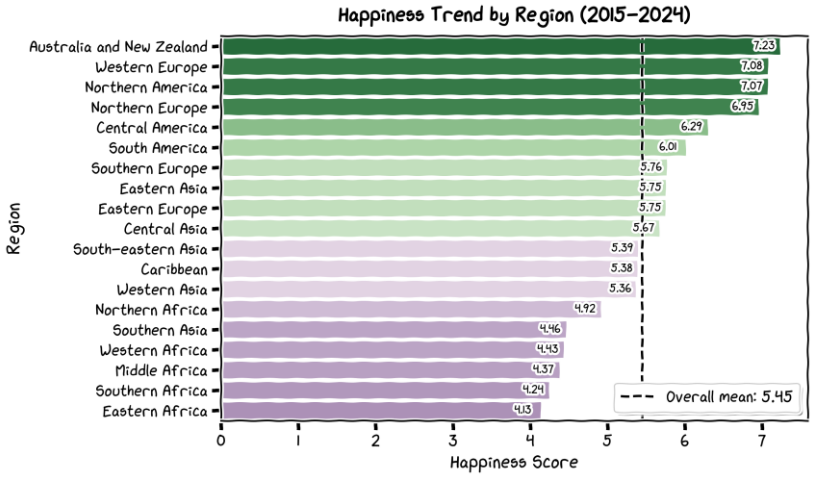


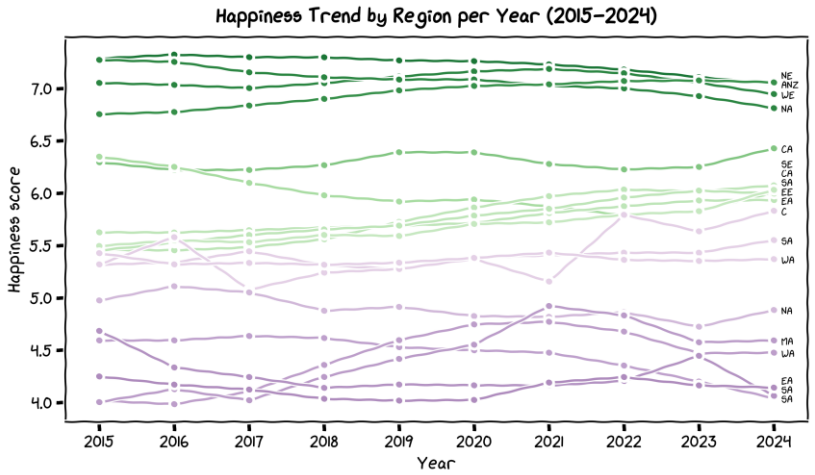






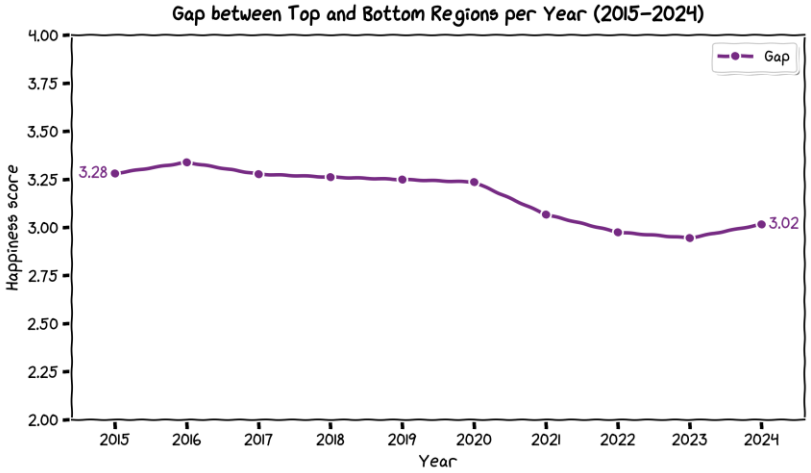
However, this region is far from static: nations such as Poland, Romania, and the Baltic states show gradual, year-by-year improvements, suggesting a slow but meaningful rise in life satisfaction. In contrast, Ukraine's consistently low scores reflect the impact of chronic instability, with the 2022 invasion marking a downward turning point in well-being. Furthermore, Western Europe offers a more nuanced picture. While countries like Switzerland, Germany, and the Netherlands remain solidly in the upper tier, others, notably Portugal and Italy, exhibit stagnation or mild fluctuations throughout the decade. Slow economic growth, shifting governments, limited opportunities, and rising living costs contribute to alternating phases of optimism and pessimism. Overall, Europe stands as a continent in which the average citizen reports relatively high levels of happiness, even if persistent regional disparities continue to challenge collective well-being.

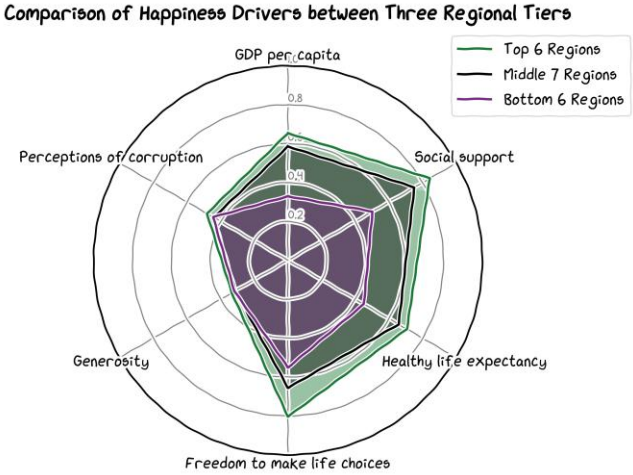




Regional dynamics: how does happiness vary across the world? To fully understand global well-being, it is useful to move beyond national borders and examine happiness trends across world regions, defined by UN codification. This regional perspective, based on the average happiness score, reveals a clear and persistent three-tier structure. At the top are six regions, including Australia and New Zealand, Western and Northern Europe, and Northern America, which steadily report happiness levels well above the global mean, with only modest annual fluctuations. Then, the middle tier comprises seven regions, such as Eastern Europe, Central and Eastern Asia. Their scores cluster around the global mean and show the greatest volatility, reflecting a trade-off between periods of economic growth and ongoing structural weaknesses and political uncertainty. At the bottom, six regions, including Southern Asia and Africa, remain significantly below the global average, due to conflicts, political instability, and widespread poverty.

Regional inequalities: how has the gap between the happiest and least happy regions evolved over time? Over the past decade, the gap between the world's happiest and least happy regions has slightly narrowed, decreasing from 3.28 points in 2015 to 3.02 points in 2024. At first glance, this modest reduction suggests that, on average, the regions in the middle of the ladder are improving faster than those at the top, which have already reached consistently high levels of well-being. However, this encouraging convergence masks a persistent and profound disparity in the foundational drivers of happiness. Indeed, a closer look at the comparison of regional tiers reveals that the top-6 regions continue to outperform both middle and bottom regions across all key factors, especially in social support, healthy life expectancy, and GDP per capita. These permanent advantages underline a critical challenge for global development. For emerging economies, closing this gap will require long-term investments that target the deeper social and health-related foundations of happiness.





LICENCE AND ATTRIBUTION

Data and visualization: all data processing and visualizations presented are original works by the author.

Graphic resources: decorative icons (emoticons) were sourced and used in compliance with the FreePik licence.

Font: the xkcd Script font, derived from the handwriting of Randall Munroe, was used for the charts under the Creative Commons Attribution-NonCommercial 3.0 License.

Maps: static maps were created using Flourish.