

ANALYSIS OF HEALTH AND LIFE EXPECTANCY TRENDS IN AUSTRALIA AND OECD COUNTRIES

COS30045 – DATA VISUALISATIONS



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I. Executive Summary:

This report examines health and life expectancy trends in Australia and OECD countries through various data visualizations, aiming to provide comprehensive insights into population health and well-being. The analysis begins with a detailed exploration of life expectancy trends over a 20-year period, showcasing Australia's notable progress in improving health outcomes compared to other OECD nations. Despite facing challenges, Australia demonstrates commendable performance in key areas such as health, environment, civic engagement, and education. However, disparities persist, particularly in work-life balance, highlighting areas for improvement.

The visualizations employed, including line charts and mind map graphs, offer unique perspectives on health metrics and mortality causes. While these visualizations effectively convey complex data, opportunities for enhancement exist. Incorporating numerical labels, improving contrast for readability, and expanding datasets for greater detail are recommended refinements to enhance comprehension and facilitate informed decision-making. By iteratively refining design elements and embracing user feedback, these visualizations can evolve into powerful tools for informing public health policies and interventions, ultimately contributing to improved health outcomes and societal well-being across OECD countries.

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III. Introduction:

Health and life expectancy are vital indicators of societal progress, providing valuable insights into the well-being of a nation. Australia, compared to many other countries in the OECD, has notably higher life expectancy, reflecting advancements in healthcare, public health efforts, and overall living standards. Despite these positive trends, persistent differences in health outcomes highlight the need for further examination within Australia.

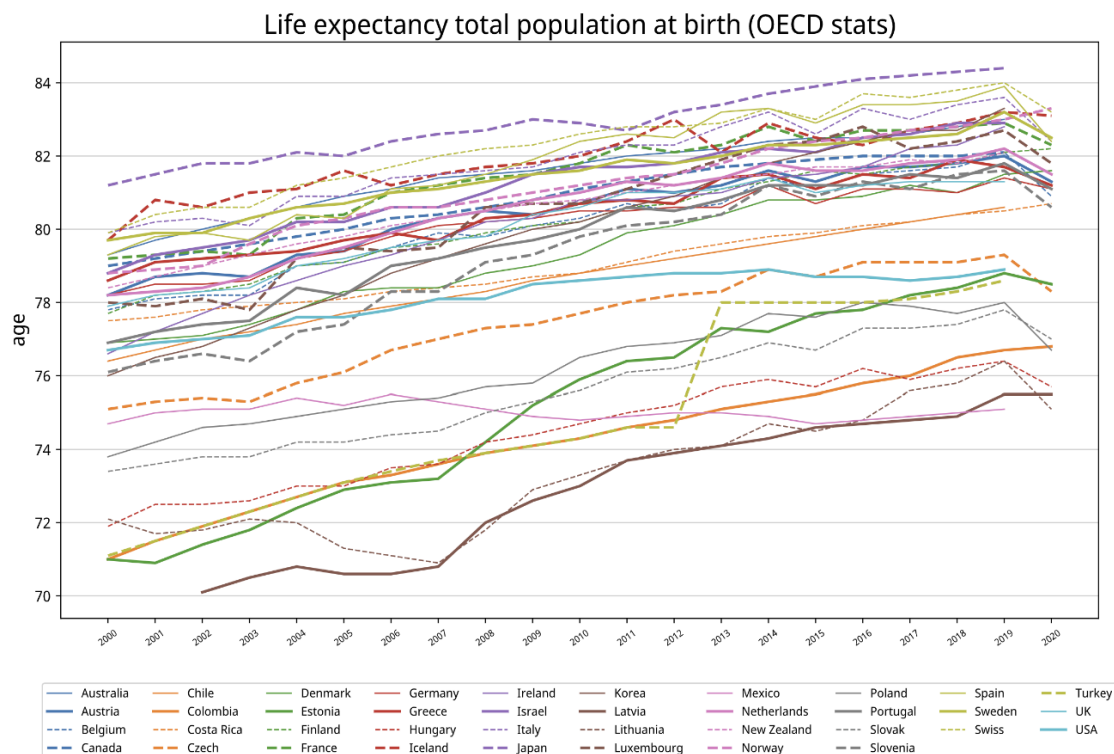
This report explores the complexities of health conditions and life expectancy in Australia, alongside other OECD nations, with the aim of identifying key factors contributing to health disparities and evaluating healthcare system effectiveness. Through this analysis, policymakers and researchers can gain valuable insights to address existing challenges and promote fair access to healthcare, ultimately improving health outcomes for all Australians.

IV. Life Expectancy:

A. Data Analysis:

Figure 1

Life Expectancy total population at birth from 2000 to 2020 (OECD stats)



Source: File: Life Expectancy in OECD.svg - Wikipedia. (n.d.).

Retrieved March 28, 2024 from

https://en.m.wikipedia.org/wiki/File:Life_Expectancy_in_OECD.svg

The line chart captures life expectancy trends over a 20-year period across 38 OECD countries. It offers a comprehensive view of how life expectancy at birth has evolved among these nations.

Examining trends in life expectancy among Organisation for Economic Co-operation and Development (OECD) countries from 2000 to 2020 reveals a pattern of consistent improvement in population health outcomes. Data aggregated from OECD member states demonstrate a notable upward trajectory in life expectancy over the specified period. This trend reflects advancements in healthcare infrastructure, access to medical services, and socioeconomic conditions across OECD nations. From 2000 onwards, the average life expectancy among OECD countries has steadily increased, indicating significant progress in addressing public health challenges and enhancing overall well-being. These improvements are attributed to various factors, including advances in medical technology, preventive healthcare measures, and public health policies aimed at promoting healthier lifestyles.

Australia stands out within the broader spectrum of OECD nations as a remarkable example of success in improving life expectancy over the last two decades. Not only does Australia exhibit a commendable trajectory, but it also holds a prominent position among the leading countries in the chart, firmly placed within the cohort boasting life expectancies ranging from 75 to 84 years between 2000 and 2020. This positioning underscores Australia's significant advancements in improving population health outcomes within the OECD framework. Positioned among the frontrunners in terms of population health outcomes, Australia has consistently shown an upward trend in life expectancy from 2000 to 2020. Beginning at 79.2 years in 2000, Australia steadily increased, reaching 83.2 years by 2020. This consistent ascent

highlights Australia's commitment to enhancing public health and well-being through extensive healthcare reforms, targeted interventions, and investments in health infrastructure, as will be elaborated upon later in the document.

B. Perspective:

From an audience perspective, the line chart presents a captivating visualization of data from 38 countries. What immediately stands out is the clarity of each line representing a country, distinguished by various colours and line types. With 10 distinct colours and 4 different line types, including variations in thickness and dashes, the chart is remarkably easy to interpret, even with the wealth of information displayed. This deliberate design choice not only enhances the chart's visual appeal but also ensures accessibility and usability for a diverse audience.

Moreover, the chart's scalability is impressive. Each country's data can extend seamlessly over time without clutter or overlap, maintaining clarity and relevance. This scalability underscores careful planning, allowing the chart to adapt to future additions to the dataset without sacrificing readability or effectiveness.

However, the graph encounters a notable challenge in representing countries with higher life expectancies. It becomes increasingly difficult

to distinguish individual lines corresponding to these nations, particularly those with longer life expectancies. Consequently, users may encounter difficulty conducting detailed analyses or comparisons for these specific countries.

C.Improvements:

To improve the graph's effectiveness, incorporating interactive features such as tooltips or highlighting could greatly assist users in identifying specific countries and lines within the graph, particularly in denser areas. Additionally, directly labelling the lines or providing a legend could offer clearer context and aid in interpretation. Exploring alternative visualizations, such as grouping countries by life expectancy brackets or employing interactive filters, might streamline the data presentation for better comprehension. Moreover, gathering user feedback and conducting usability testing could provide valuable insights into areas for enhancement and guide future iterations of the graph.

Expanding the graph size or widening the gap between age intervals could also enhance its readability and analytical capabilities. Enlarging the graph would create more space between lines, reducing clutter and facilitating easier differentiation between individual countries, particularly those with longer life expectancies. Additionally, increasing the age intervals on the x-axis would improve clarity by

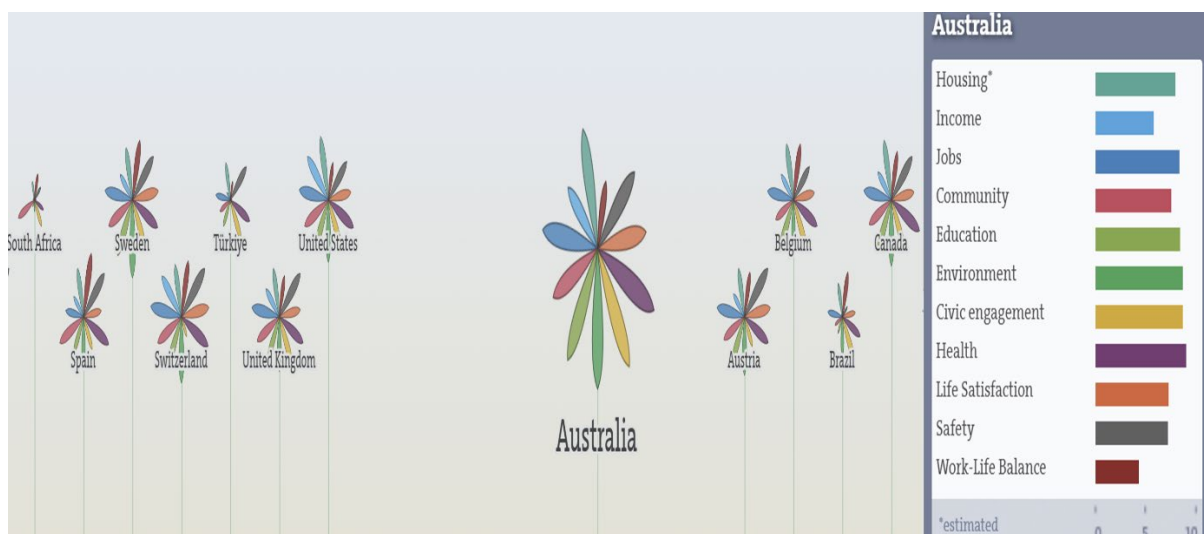
allowing users to observe trends over broader timeframes, enabling more comprehensive analysis. These adjustments would not only enhance the graph's visual appeal but also its functionality, empowering users to derive more meaningful insights from the presented data.

V. Australia Index:

A. Data Analysis

Figure 2:

Australia OECD Better Life Index



Source: OECD Better Life Index. (n.d.). Retrieved March 28, 2024
from <https://www.oecdbetterlifeindex.org/countries/australia/>

Australia's well-being, illustrated by the flower graph, demonstrates commendable performance across various dimensions compared to other OECD countries such as the United States, the United Kingdom, and Switzerland. This innovative visualization method effectively portrays each aspect of a country's well-being, highlighting Australia's notable strengths. Particularly, Australia excels in health, environment, civic engagement, and education, standing out among its peers in these areas. The flower graph emphasizes health as a standout

strength for Australia, outperforming all other countries in the comparison. Additionally, Australia receives high marks in the environment category, reflecting positive perceptions of environmental quality and sustainability efforts. Moreover, the graph underscores Australia's robust performance in civic engagement and education, indicative of an active citizenry and a strong educational system, ultimately contributing to overall societal well-being.

However, the flower graph also reveals challenges for Australia, notably in work-life balance, where it lags behind other countries in the comparison. This suggests areas for improvement in fostering a healthier equilibrium between work and personal life. Despite this challenge, Australia maintains competitive scores in other dimensions such as housing, jobs, community, and safety, reflecting a generally favourable quality of life and well-being for its residents. Through the flower graph's intuitive visualization, policymakers and stakeholders gain valuable insights into Australia's well-being landscape, identifying areas for enhancement and guiding future policy interventions to further enhance societal prosperity and quality of life.

B. Perspective:

From an audience perspective, the unique design of the line chart immediately captivates attention, resembling a floral arrangement where each country serves as a distinct "petal" representing various health aspects. This innovative visualization not only makes the data visually

appealing but also enhances comprehension by offering a metaphorical representation of health dimensions. With 11 petals corresponding to different health dimensions, including mental, physical, and environmental factors, the data presentation becomes remarkably intuitive. Furthermore, the size of each petal corresponds to the magnitude of the aspect, offering a visual cue that facilitates quick comparisons between countries. The use of distinct colours for each aspect enhances clarity, enabling users to effortlessly track and analyse data across different dimensions.

Moreover, the user-friendly nature of the graph ensures accessibility to a wide range of audiences, eliminating the need for specialized expertise to interpret the data effectively. Beyond its aesthetic appeal, the graph's metaphorical representation fosters a deeper understanding of complex health metrics, making it accessible to users with varying levels of familiarity with health data analysis. Additionally, the use of vibrant colours not only adds visual interest but also serves as an effective organizational tool, aiding users in distinguishing between different health dimensions. This intuitive approach encourages engagement and facilitates meaningful exploration of the data, empowering users to derive valuable insights into health trends and disparities across countries.

Indeed, a notable drawback of the graph is its lack of numerical labels, which makes it challenging to conduct precise comparisons between countries and across different health aspects. Without

numerical indicators, determining the exact ranking of countries or discerning differences between countries with similar scores becomes difficult. This absence of numerical data may limit the graph's usefulness, especially for users who require detailed quantitative insights to understand the data fully. Adding numerical labels would improve the graph's effectiveness by providing users with a clearer reference point for interpreting and analysing the presented information, thereby enabling more informed comparisons and evaluations.

C.Improvements:

To enhance the graph's usability, integrating numerical labels alongside the floral "petals" would enable more precise comparisons between countries and aspects. This addition would streamline interpretation and aid in discerning variations, particularly among countries with similar scores. Moreover, incorporating interactive features like tooltips could enrich user experience, allowing for seamless exploration and access to detailed insights with a simple hover or click. A complementary legend elucidating the significance of each aspect's colour and size would further enhance clarity and ease of interpretation.

Conducting thorough user testing and soliciting feedback would provide valuable guidance for further refinement, ensuring the graph effectively communicates complex health data to a diverse audience. By iteratively incorporating user insights and refining design elements, the

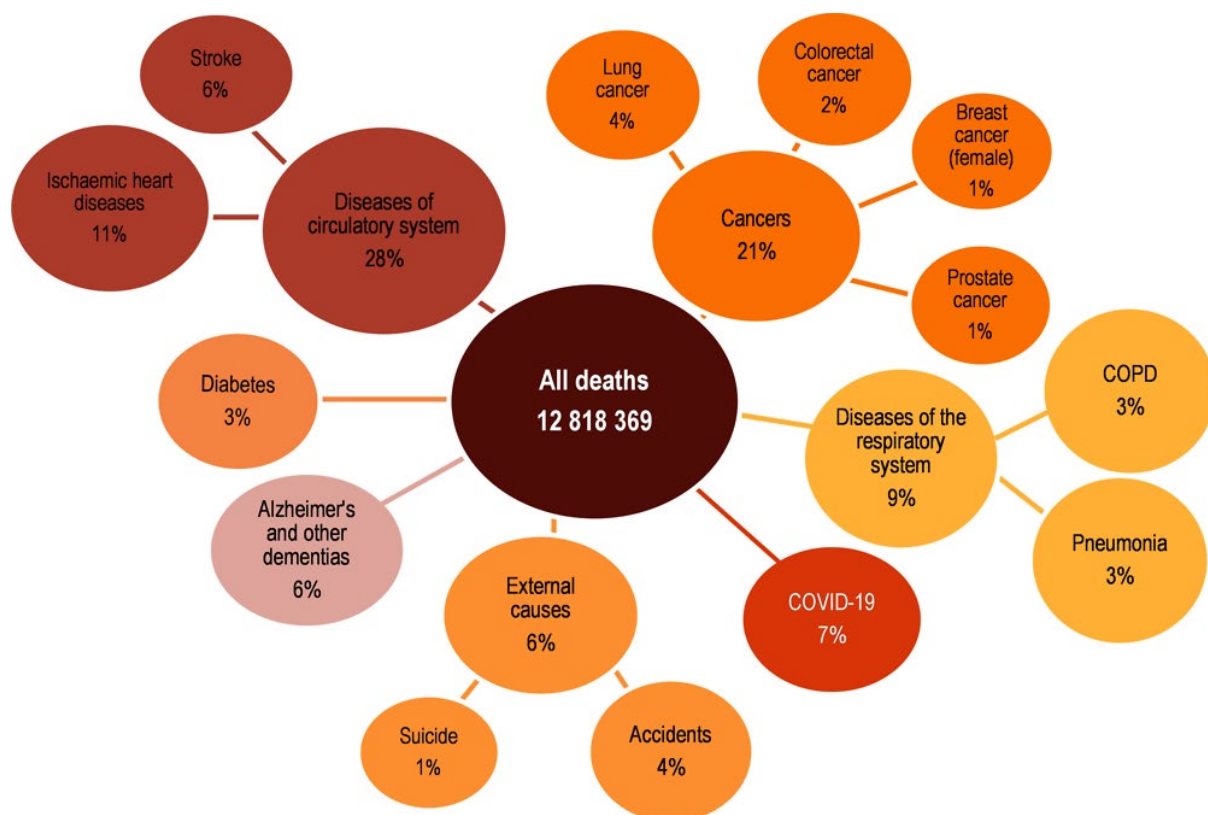
graph can evolve into a more user-friendly and informative visualization tool.

VI. Causes of Deaths:

A. Data Analysis:

Figure 3

Main causes of mortality across OECD countries, 2021



Oecd. (2023). Main causes of mortality | Health at a Glance 2023: OECD Indicators | OECD iLibrary. Retrieved March 28, 2024 from https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2023_216c1c0e-en

The presented mind map offers a visual representation of the complex landscape of mortality patterns among OECD countries, shedding light on the diverse array of factors influencing public health outcomes. Notably, diseases of the circulatory system, including ischemic heart diseases and stroke, emerge as primary contributors, collectively representing a significant 28% of all deaths. This underscores the urgency of implementing targeted interventions to mitigate cardiovascular risks and reduce mortality rates. Moreover, cancers, particularly lung cancer, feature prominently, comprising 21% of total deaths. This highlights the importance of adopting comprehensive approaches that integrate preventive measures, early screening, and effective treatment strategies to tackle the multifaceted challenges associated with cancer-related mortality.

Furthermore, external causes such as accidents and suicides play a significant role, accounting for 6% of all deaths, accentuating the necessity for robust injury prevention measures and mental health support systems. Concurrently, diseases of the respiratory system, Alzheimer's, and other dementias, along with diabetes, each contribute significantly to mortality, emphasizing the imperative for integrated healthcare strategies addressing diverse chronic conditions. The notable emergence of COVID-19 as a substantial cause of death, representing 7% of total deaths, underscores the persistent challenges posed by infectious diseases and the imperative for coordinated responses to pandemic outbreaks.

B. Perspective:

From my perspective, the mind map graph's unique design immediately captivates attention with its resemblance to a network of interconnected ideas, each serving a distinct purpose. This innovative visualization not only enhances visual appeal but also aids comprehension by structuring mortality causes in a clear and organized manner.

The graph's clear distinctions in font, legends, percentages, and colours for each category contribute to its remarkable intuitiveness. For instance, diseases of the circulatory system stand out vividly in a strong red colour, with related conditions sharing the same hue, facilitating easy identification and comparison. Moreover, the graph's scalability allows for seamless exploration, with larger circles representing higher percentages, ensuring consistent aspect ratios for accurate visual representation and easy comparison across categories.

However, a notable limitation lies in the scaling of percentages, potentially distorting the perception of smaller categories within the graph. Furthermore, the absence of detailed information for smaller areas may restrict comprehensive understanding and analysis. Additionally, readability issues arise from the contrast between text and background colours, especially when dark text is juxtaposed against vibrant background colours. For instance, the combination of strong red for diseases of the circulatory system and black text may hinder legibility,

detracting from the overall user experience. Addressing these issues would enhance the graph's effectiveness in conveying information and facilitating meaningful insights into mortality trends.

C.Improvements:

To enhance the mind map graph's effectiveness, several improvements could be considered. Firstly, providing numerical labels alongside the percentages would offer users precise quantitative information, enabling more accurate comparisons between categories. Additionally, incorporating interactive features such as tooltips or clickable elements could provide users with additional details or insights when they hover over specific areas of interest.

Moreover, improving the contrast between the text and background colours within the circles would enhance readability, making it easier for users to discern the information presented. Furthermore, expanding the graph's dataset to include more detailed subcategories of mortality causes could offer users a more comprehensive understanding of health trends and disparities.

VII. Conclusion:

In conclusion, the diverse array of graphs presented offers unique insights into various aspects of health and well-being across OECD

countries. From the captivating line chart resembling a floral arrangement to the structured mind map graph depicting mortality causes, each visualization provides valuable information in distinct ways. While these graphs excel in their innovative designs and intuitive representations, there are opportunities for improvement. Incorporating numerical labels, enhancing contrast for readability, and expanding datasets for greater detail are just a few avenues for refinement. By embracing user feedback and incorporating interactive features, these visualizations can evolve to better serve their audiences, fostering deeper understanding and facilitating informed decision-making regarding public health policies and interventions.

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