American Journal of
Biomedical Science & Research

www.biomedgrid.com
ISSN: 2642-1747

Mini Review

Sustainable Indexes in EU Member States: The Influence of a Balanced Diet and Regular Exercise on Healthy Lifespan

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To Cite This Article: *Efthymios Spyridon Georgiou*. Sustainable Indexes in EU Member States: The Influence of a Balanced Diet and Regular Exercise on Healthy Lifespan. Am J Biomed Sci & Res. 2025 25(4) AJBSR.MS.ID.003336,* **DOI:** 10.34297/AJBSR.2025.25.003336

Received: January 15, 2025; **Published:** January 21, 2025

Abstract

The current paper aims to measure, map, and conduct a statistical analysis of health indicators in EU member states. Its purpose is to visualize and report findings related to daily consumption of fruits and vegetables, participation in cultural or sports activities, and the total number of healthy life years at birth. The goals include classifying the data, developing policies to improve the current situation, and creating digital maps for visualization. The methodology relies on a statistical analysis of data from Eurostat, the official statistical office of the European Commission, along with bibliographical research and documentation of mathematical statistics. The results highlight the influence of daily nutrition and exercise on healthy life years at birth. Mapping visualizations serve as an effective means to present and share these findings.

Introduction

The current paper analyzes the health situation in EU Member States. This independent study examines the health conditions of individuals living in European countries. The key questions addressed in the paper are as follows:

1) What is the daily consumption of fruits and vegetables among the population?

2) How many individuals participated in cultural or sports activities in the last 12 months?

3) How do factors 1 and 2 influence the number of healthy life years at birth in absolute terms?

4) What policies contribute to these health outcomes?

5) What strategies can be implemented to improve the indicators in questions 1, 2, and 3?

The quality of diets is crucial for individual health, emphasizing the importance of healthy, varied, and balanced nutrition [2]. Health policymakers would benefit from a population-based index, as it incorporates multiple health dimensions [10].

Positive health outcomes are often associated with sound practices, and these activities tend to have a cumulative relationship [5]. Additionally, behavior, lifestyle, and policy changes that reduce socioeconomic disparities can help achieve health and life expectancy levels comparable to those in peer societies [7].

The Lifespan Strategies

The health landscape of the 21st century is shaped by increased interdependence at global, regional, national, and local levels, along with a complex array of interrelated factors that influence health and well-being [23]. Policymakers, healthcare providers, and patients share a common goal: to ensure that individuals accessing health services receive high-quality care. This care must be safe, effective, and responsive to the needs of patients [24].

The Successful Policies

Evaluating the rapid spread of new healthcare technologies poses a significant challenge for researchers and policymakers [3]. In 1998, the World Health Organization (WHO) defined health promotion programs, policies, and activities through the principles of holistic inter-sectionalism, empowerment, social participation, equality, multi-strategic actions, and sustainability [21]. The policy brief outlines six essential conditions for effective health policy implementation within the framework of Health 2020:

1) Ensure that contexts are appropriate and receptive,
2) Get the timing right,
3) Transfer relevant policies and innovations,
4) Ensure good governance,
5) Collaborate with other sectors,
6) Transition from exploration to full implementation.

Understanding how these conditions can be effectively utilized in specific national contexts and policies will assist health policymakers in enhancing the chances of success for the policies they develop and seek to implement [16].

The Significant of Daily Diet

Numerous studies have explored the combined effects of diet and exercise on body composition and resting metabolic rate [15]. The Mediterranean diet, originally described by Ancel Keys, is characterized by low saturated fat content and a high intake of vegetable oils. This dietary pattern was commonly observed in Greece and Southern Italy during the 1960s [8].

Daily food intake can be influenced by several factors, including the number of meals consumed, the size and duration of those meals, and the rate at which food is eaten. In contrast, rumination refers to the frequency and length of time spent chewing food, as well as the number of boluses produced [1]. While the importance of dietary management in diabetes is widely acknowledged, patients often find it challenging to learn and maintain effective self-management behaviors [19].

The American Cancer Society (ACS) guidelines for cancer survivors recommend regularly consuming vegetables, fruits, and whole grains. Previous evidence suggests that promoting a healthy diet may help reduce the risk of recurrence, alleviate stress, and minimize breast and arm symptoms [4].

The Index of Daily Consumption of Fruit and Vegetable

Fruits and vegetables are widely recognized as healthy food options. The Dietary Guidelines for Americans (2010) recommend that half of your plate consist of fruits and vegetables [22]. It is also important to classify different types of fruits and vegetables in dietary guidance materials. This classification helps individuals choose the appropriate varieties to meet their nutritional and health needs [14]. Although some studies may downplay insignificant findings, current research indicates a strong protective effect of fruits and vegetables against stroke, with a weaker protective effect noted for coronary heart disease [13].

Table 1 illustrates the daily consumption of fruits and vegetables in the European Union from 2014 to 2020. The data shows that 36% of individuals consumed zero portions, 52.1% consumed between one and four portions, while 11.9% consumed five or more portions. Table 2 provides information on the daily consumption of fruits and vegetables in the European Union from 2019 to 2020. In this period, 32.9% of individuals consumed zero portions, 54.7% consumed one to four portions, and 12.4% consumed five portions or more.

Table 1:

Daily consumption of fruit and vegetables, 2014			
	0 portions	From 1 to 4 portions	5 portions or more
European Union from 2020	36.00%	52.10%	11.90%

Table 2:

Daily consumption of fruit and vegetables, 2014			
	0 portions	From 1 to 4 portions	5 portions or more
European Union from 2020	0.36	0.521	0.119

There has been a gradual increase in portion sizes from 1 to 4. Specifically, there is a 2.6% increase for two portions and a 0.5% increase for five portions or more. These positive changes are a result of European policies and an overall improvement in quality of life. Peaceful initiatives and prioritized efforts by European Union member states have led to systematic improvements in daily diets. Agricultural policies and market regulations work together to create a healthier and safer environment and living conditions.

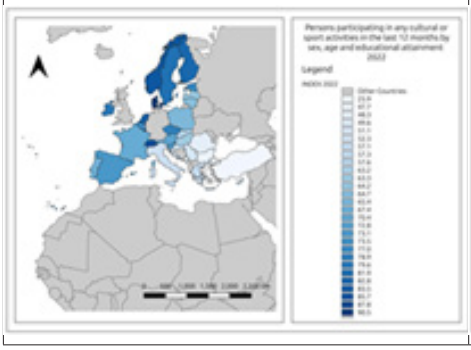
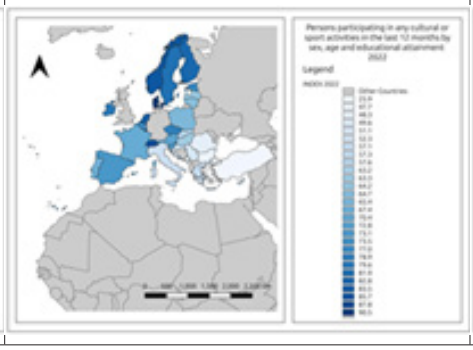
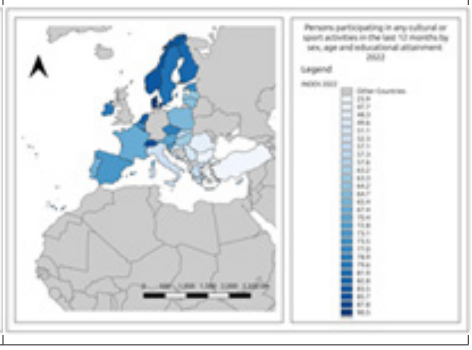
The Index of Person Participating in Any Cultural or Sport Activities

Table 3 examines the participation of individuals in cultural and sports activities over the past 12 months, based on data from three time periods: 2006, 2015, and 2022. In 2006, there was notable participation in cultural and sports activities in Southern Europe. The strategies and policies implemented during this time included

improvements to green spaces, the promotion of creative leisure activities, the establishment of healthy living standards, and the creation of safe living environments, all driven by political decisions.

By 2015, data showed a gradual increase in participation among countries in Central Europe. Specifically, in France, Germany, Austria, and Switzerland, residents began to spend more time engaging in cultural and sports activities. The most recent data from 2022 indicated further growth, with an increasing number of people across more countries dedicating time to these activities. Notably, Spain and Portugal exhibited significant increases in participation compared to other European countries (Table 3).

Table 3:

Persons Participating in any cultural or sport activities in the last 12 months		
2006	2015	2022
		

Extensive cohort studies indicate that participating in sports is associated with a 20-40% reduction in all-cause mortality compared to those who do not engage in sports. Randomized trials and crossover clinical studies suggest that participating in sports offers specific health benefits [11].

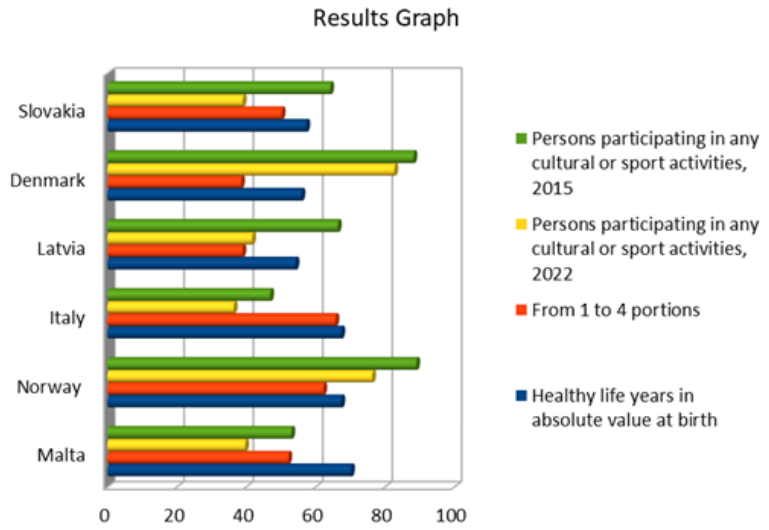
Involvement in sports is significant and not to be taken lightly [6]. The relationships among sports, physical activity, and health are influenced by complex struggles related to political positions, policymaking, and the implementation of policies [12].

Individuals living in colder climates, such as Canada and Norway, are more likely to participate in snow sports like skiing and snowboarding compared to those in warmer regions like Mexico and Australia. Furthermore, safety concerns, environmental factors (such as aesthetics), and access to facilities (like parks) can either hinder or encourage participation in physical activities [9].

Results

Table 4 illustrates the relationship between individuals participating in cultural or sports activities, consuming 1 to 4 portions of food, and the absolute number of healthy life years at birth. The accompanying graphs highlight the highest and lowest observed values.

Table 4:



The results indicate a strong correlation between lifespan and a healthy diet. Additionally, sports participation declined in all countries from 2015 to 2022, largely due to the pandemic. During this time, many people engaged in indoor activities at home or in the office. The restrictions on movement during the pandemic had a significant psychological impact on individuals. Moreover, the current global situation reveals instability in political conditions that change rapidly. The recent flu outbreak in China has the potential to spread quickly around the world. Furthermore, air pollution resulting from conflicts in Ukraine and the Gaza Strip poses serious health risks to many neighboring countries.

Additionally, temperature plays a significant role in creating a positive atmosphere and fostering good relationships among people. For instance, Malta and Italy are Mediterranean countries known for their pleasant climates. As a result, Malta's satisfaction level is exceptionally high, particularly during the summer months (Table 5).

Table 5:

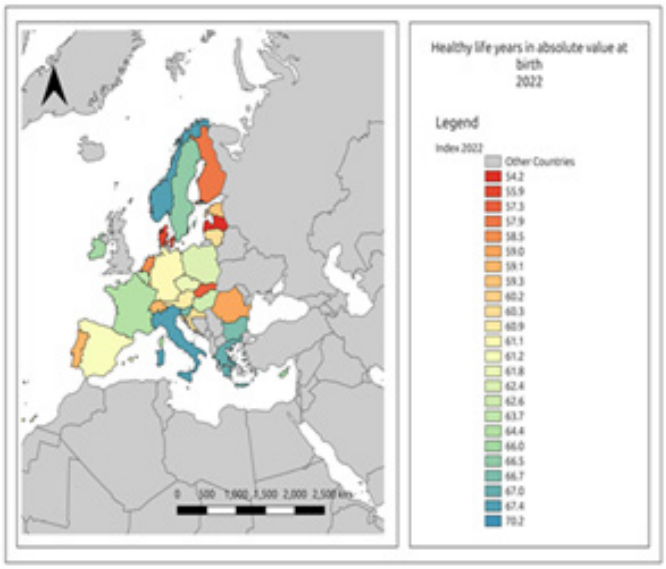
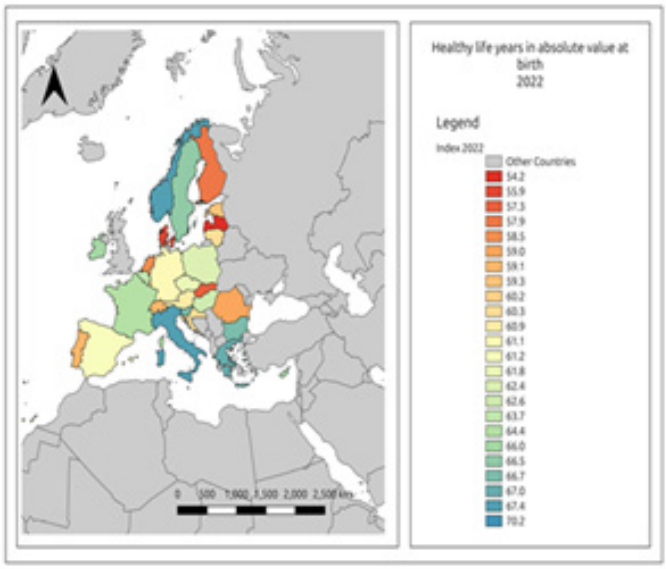
Healthy life years in absolute value at birth, 2013	Healthy life years in absolute value at birth, 2022
	

Table 5 presents a map that shows the absolute values of healthy life expectancy at birth for the years 2013 and 2022. This map was created using QGIS and is based on statistics provided by the European Commission. The shapefile used for the map was obtained from Eurostat NUTS-2, and the indexes were mathematically formatted.

Discussion

Recent studies show that income inequality is a significant predictor of mortality rates and health status in relatively wealthy societies [17]. The Sustainable Development Goals (SDGs), adopted in September 2015, emphasize the connection between health and economic development policies [18].

Discussions surrounding poverty often focus on whether it should be measured by outcomes such as life expectancy or by inputs like income, highlighting an ongoing debate about nutritional standards [20]. The SDGs feature numerous specific targets and indicators related to health across several of the 17 overarching goals, with Goal 3 primarily focusing on health. This goal aims to "ensure healthy lives and promote well-being for all ages" [18].

Additionally, while many studies indicate that the link between socioeconomic status and mortality is generally weaker for women than for men, few have investigated income and health inequalities separately for both genders [17]. The findings suggest that countries following guidelines set by global organizations and aligning with the priorities of the European Commission tend to achieve positive outcomes. Characteristics of successful urban environments include effective city planning, abundant green spaces, and progressive city policies, all of which are essential for creating prosperous and democratic solutions for residents. Statistics show a gradual increase in healthy life expectancy, with Nordic countries leading the way in promoting healthy initiatives.

In recent years, EU member states in Central Europe and the Iberian Peninsula have implemented similar policies and models to enhance life expectancy. Mediterranean countries like Italy and Greece benefit from their rich historical and traditional cuisines, which provide significant health advantages. Overall, evidence suggests that high consumption of vegetarian foods and fruits, along with the promotion of leisure activities, positively impacts healthy lifespans.

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