

STATISTICS ON THE PROGRESS OF HEALTH INTERVENTIONS IN REDUCING PREMATURE MORTALITY WORLDWIDE ACCORDING TO WHO DATA FOR 2025

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Abstract

Premature mortality, defined as death before the age of 70, is a major global health challenge that significantly impacts socioeconomic productivity, particularly in low- and middle-income countries (LMICs). This study aims to describe the statistical trends of global health interventions in reducing premature mortality rates based on 2025 data from the World Health Organization (WHO). The method used is a qualitative descriptive analysis of secondary data trends regarding life expectancy, causes of death, and the Universal Health Coverage (UHC) coverage index. The analysis results indicate that although the COVID-19 pandemic caused sharp fluctuations in 2021, post-pandemic global trends demonstrate success in controlling premature mortality, resulting in mortality patterns once again being dominated by the over-70 age group. Noncommunicable diseases (NCDs) remain the primary contributor to premature mortality at 74%, yet strategic interventions such as tobacco control policies, promotion of healthy lifestyles, and strengthening of early detection have proven effective in reducing fatality rates. The increase in the global Universal Health Coverage (UHC) Service Coverage Index, which reached 69 points in 2023, serves as a crucial foundation for achieving the 2030 SDGs. The conclusions of this study affirm that integrated, equitable, and primary prevention-based health interventions are the key to increasing life expectancy and reducing the economic burden caused by deaths during productive years.

Keywords: Premature Mortality, Health Interventions, WHO 2025, Life Expectancy.

1. INTRODUCTION

Health is a fundamental human right and a key prerequisite for sustainable social and economic development. Within the framework of the United Nations Sustainable Development Goals (SDGs), particularly Goal 3, the world is committed to ensuring healthy lives and promoting well-being for all people of all ages (United Nations, 2015). However, despite significant advances in medicine and health technology over the past few decades, global health challenges remain highly complex and dynamic (World Health Organization, 2023). Therefore, stronger global synergy is needed to address disparities in access to primary health care, especially for communities in vulnerable regions and developing countries.

One of the most critical indicators for measuring the success of a health system is the rate of premature mortality, defined as death before the age of 70. Premature death has significant economic and social implications because it affects the productive age group. Rising mortality rates among the productive-age population not only result in the loss of potential human resources but also place a burden on social security systems and reduce national productivity. The causes of these premature deaths are highly diverse, ranging from complications of poorly

managed noncommunicable diseases (NCDs), traffic accidents, to re-emerging infectious diseases in various regions. The inability to reduce mortality rates among those under 70 years of age serves as an indicator of failure in achieving Universal Health Coverage (UHC) (WHO, 2023).

Specifically, an in depth analysis of the causes of premature death reveals that this burden is significantly dominated by Non-Communicable Diseases (NCDs), with cardiovascular diseases (heart disease and stroke) as the primary contributors, accounting for more than 30% of total global premature deaths (World Health Organization, 2022). This phenomenon occurs disproportionately in low- and middle-income countries (LMICs), where approximately 77% of global premature deaths result from limited access to health services and high exposure to behavioral risk factors. Nevertheless, data indicate that the majority of these premature deaths are preventable through integrated health interventions, ranging from tobacco control policies and sugar taxes to strengthening systems for the early detection of hypertension and diabetes. It is this disparity between the high disease burden in developing countries and limited intervention capacity that constitutes the primary urgency in evaluating global health progress statistics, particularly in the context of the WHO's 2025 data projections. The purpose of this paper is to describe the statistical progress of global health interventions in reducing premature mortality rates worldwide based on 2025 World Health Organization data.

Literature Review

1. The Concept of Early Mortality and its Economic and Social Significance

Early mortality (also known as premature mortality) is universally defined as death occurring before an individual reaches the age of 70 (WHO, 2023). In theory, death in this age range is considered a major loss for development, as it cuts short the productive years of individuals who should be contributing to the economy and society. In line with the United Nations' argument in SDG Goal 3 (2015), health is not only a human right, but also a prerequisite for sustainable economic growth. The inability of health systems to reduce premature mortality reflects a failure to implement Universal Health Coverage (UHC) and manage environmental and behavioural risk factors.

2. Epidemiological Transition and the Dominance of Non-Communicable Diseases (NCDs)

WHO data (2025) highlight a shift in the global disease burden. While communicable diseases dominated mortality rates in the 19th and early 20th centuries, the latest data confirm that non-communicable diseases (NCDs) now account for 74% of premature deaths worldwide. Cardiovascular disease, cancer, diabetes, and respiratory diseases are the main contributors. According to Ezzati & Riboli (2013), this phenomenon is exacerbated in low- and middle-income countries (LMICs), where 77% of NCD deaths occur due to limited access to early detection and high exposure to risk factors such as tobacco use and poor diet.

3. Trends in Life Expectancy and the Impact of the Pandemic

Life expectancy is a composite indicator that is heavily influenced by the rate of premature death. According to Our World in Data statistics, the global life expectancy has exceeded 70 years, indicating the success of medical science. However, an anomaly occurred during the 2020–2021 period due to the pandemic, which caused a sharp increase in mortality among people under 70 years old (peaking at 35 million in 2021). This temporarily lowered the global life expectancy average before it recovered in 2023 due to the effectiveness of vaccination interventions and the recovery of primary healthcare services.

4. The Effectiveness of Health Interventions in Reducing Risk

Health interventions have proven to be key in changing the trajectory of mortality statistics. Literature and data from the WHO (2024) highlight several key strategies:

- a. Fiscal Policies and Regulations
Increasing tobacco taxes by 10% can reduce consumption by up to 4%, which has a direct impact on reducing the risk of cancer and heart disease.
- b. Lifestyle interventions
Reducing salt intake and promoting 150 minutes of physical activity per week can reduce the risk of stroke and heart disease by up to 30%.
- c. Strengthening Primary Services
The use of affordable medications such as statins and metformin, as well as early detection through screening (such as HbA1c tests and mammograms), has been proven to be cost-effective. For every \$1 invested in preventing NCDs, \$7 is saved in healthcare costs.

5. Accessibility and Universal Health Coverage (UHC)

The success of reducing early mortality is highly dependent on the UHC Service Coverage Index Data shows a surge from 45 in 2000 to 69 in 2023. Despite progress, literature highlights sharp regional inequalities, with a difference of 30 points between the European and Sub-Saharan African regions. To achieve the SDG target of 80 by 2030, digital health services must be integrated and distributed evenly to ensure that populations in vulnerable areas have equal access to preventive care.

6. Statistics as a Reflection of Civilisation

The integration of statistical data and philosophical values (as represented in mathematical batik motifs) shows that mortality and life expectancy rates are not just cold data. Statistics are a reflection of humanity's journey to improve quality of life. The decline in early mortality below the age of 70 years after 2021 indicates a return to the "normal" pattern of mortality (dominated by older age), which is an indicator that global health interventions are beginning to stabilise human productivity amid dynamic epidemiological challenges.

2. MATERIALS AND METHODS

2.1. Type of Research

This research is a quantitative study with a descriptive analytical approach. This method is employed to analyze numerical data and provide a comprehensive description of global health indicators, specifically focusing on premature mortality trends and the effectiveness of health interventions.

2.2. Research Scope and Time

While the researchers are based in Yogyakarta, the scope of this study is Global (Worldwide). The analysis utilizes statistical data projected for 2025 and historical data from the 2019–2024 period. The data synthesis and modeling were conducted during the reporting period of 2026.

2.3. Data Sources

The study relies on secondary data sourced from reputable international health and statistical organizations:

- a. World Health Organization (WHO): World Health Statistics 2024 and 2025 projections.
- b. Our World in Data: Global life expectancy and mortality trends.
- c. IHME (Institute for Health Metrics and Evaluation): Global Burden of Disease (GBD) data.

2.4. Research Variables

The primary variables analyzed in this study include:

- a. Premature Mortality Rate: Deaths occurring before the age of 70.

- b. Universal Health Coverage (UHC) Service Coverage Index: Progress in global health access.
- c. Non-Communicable Disease (NCD) Fatality Rates: Including Cardiovascular Diseases, Cancer, Diabetes, and Chronic Respiratory Diseases.
- d. Risk Factor Reduction Indicators: Tobacco control, physical activity, and early screening coverage.

2.5. Data Collection Techniques

Data collection was performed using the documentation method. This involved systematic gathering, filtering, and extraction of official reports and databases published by the WHO and affiliated global health monitoring bodies.

2.6. Data Processing Techniques

The collected data underwent several processing stages:

- a. Editing & Cleaning: Ensuring data consistency across different sources.
- b. Tabulation: Categorizing data by age group (Under 70 vs. Over 70) and cause of death.
- c. Visualization: Presenting data through comparative tables and trend graphs.

2.7. Data Analysis Techniques

Data analysis was conducted using descriptive statistics and comparative analysis through the following steps:

- a. Presenting mortality trends in time-series tables.
- b. Comparing pre-pandemic (2019), pandemic (2021), and post-pandemic (2023–2025) indicators.
- c. Calculating the percentage contribution of NCDs vs. Infectious Diseases to global mortality.
- d. Analyzing the correlation between UHC index increases and the reduction of premature deaths.

3. RESULTS AND DISCUSSION

3.1. Global Premature Mortality Statistics

Life expectancy is one of the key indicators used to describe the health and well-being of a population. This indicator reflects the average age a population is expected to reach based on prevailing mortality patterns. According to global data released by the World Health Organization, global life expectancy has shown an upward trend in recent decades, in line with advances in health interventions, increased access to medical services, and improvements in social and environmental conditions.

Premature mortality is a key factor influencing life expectancy trends. Premature mortality, defined as death before the age of 70, directly contributes to a decrease in the average life expectancy of the population (Renard et al., 2015). High mortality rates among the working-age population limit opportunities for increasing life expectancy, particularly in low- and middle-income countries. WHO data indicate that the majority of premature deaths are caused by NCDs, particularly cardiovascular diseases, which have a significant impact on the mortality structure of the population.

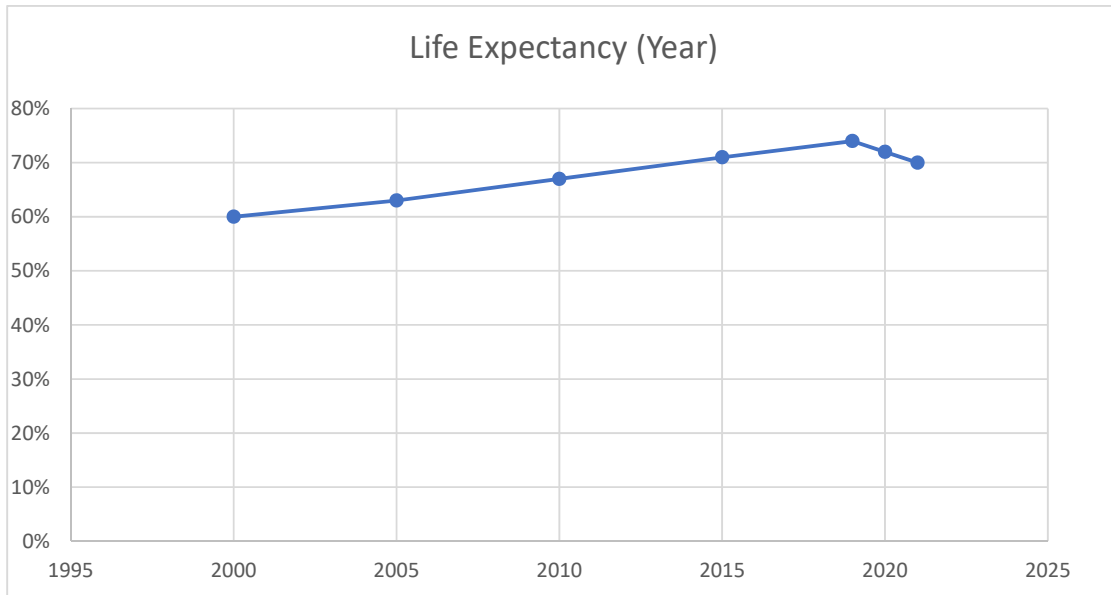


Figure 1. World Life Expectancy Chart Source: Our World in Data

The world's life expectancy graph shows a very significant increase from the end of the 18th century to the beginning of the 21st century. Initially, life expectancy globally was below 30 years and increased slowly until the end of the 19th century. A more pronounced increase began to occur in the 20th century, alongside advances in health interventions, improved sanitation, and the control of infectious diseases. In recent years, the global life expectancy has exceeded 70 years, despite a temporary decline due to the pandemic. This trend shows that a decrease in mortality, including premature mortality, is a key factor in increasing life expectancy globally.

The increase in life expectancy is a key indicator of the success of human civilisation in integrating scientific medical advances with inclusive public policies. Fundamentally, the trend of increasing the average age of the global population is driven by epidemiological transition, whereby the world has succeeded in controlling the threat of infectious diseases that were previously the main cause of premature death in children and adults. This success is due to the expansion of access to clean water, improved environmental sanitation, and strengthened mass immunisation programmes, which create a more stable foundation for public health.

There is an inverse relationship between life expectancy and the mortality rate among people under the age of 70, with a reduction in premature deaths being key to increasing the average age of the population. Statistically, every death that occurs at a young or productive age has a significant negative impact on the value of life expectancy due to the loss of potential years of life that could have been achieved. If the number of deaths under the age of 70 remains high, this indicates a significant economic burden due to the loss of productive labour, as well as indicating that the health system is not optimal in dealing with non-communicable diseases.

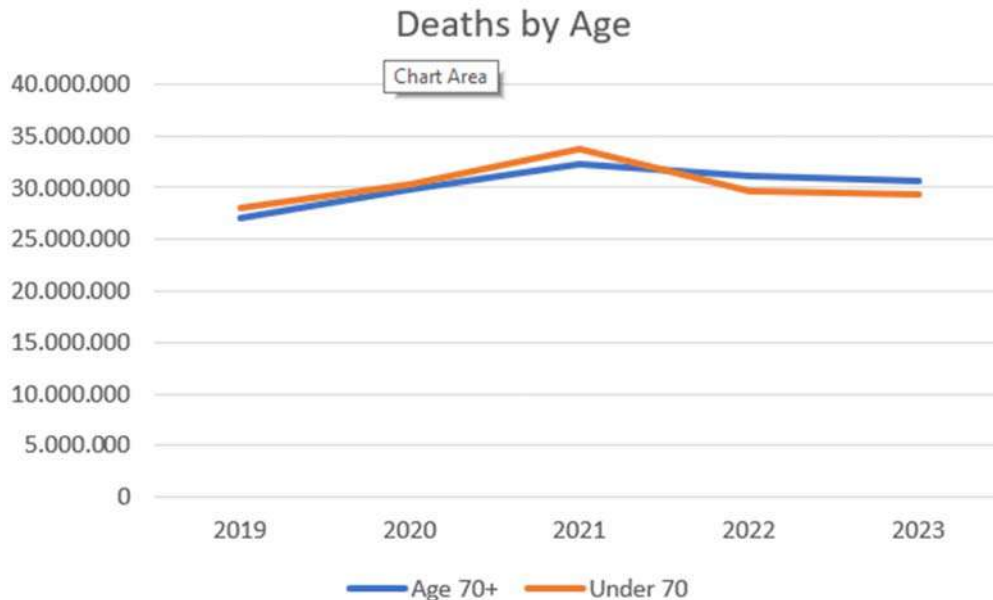


Figure 2. Death Rate by Age

Data source: IHME, Global Burden of Disease (2025)

Based on the graph, a significant increase is evident in both age groups, peaking in 2021. At the beginning of the period (2019–2020), the number of deaths in the under-70 age group consistently remained slightly higher than that of the 70-and-over age group. A sharp spike occurred in 2021, when the death toll for the under-70 age group nearly reached 35 million, reflecting an anomaly or health crisis that had a greater impact on the younger population compared to the elderly at that time.

However, after 2021, a contrasting shift in dynamics occurred between the two groups. The under-70 age group experienced a fairly drastic decline in mortality rates, which continued to level off through 2023. Conversely, mortality rates among those aged 70 and older tended to remain at high levels and saw only a slight decline; consequently, starting in 2022, this elderly group officially surpassed the mortality rate of the younger age group. This indicates that the factors causing premature death are beginning to be brought under control, so that mortality patterns are returning to “normal” conditions where the risk of death naturally increases with age, rather than being dominated by younger age groups.

3.2. Causes of Death Among People Under 70

As we enter the mid-2020s, the global health landscape reveals a fundamental shift that is both challenging and promising. According to the latest statistical report from the World Health Organization (WHO) for 2025, the world is witnessing a turning point in efforts to reduce premature mortality, particularly among those under the age of 70. Although the challenges posed by noncommunicable diseases (NCDs) such as cardiovascular disorders and cancer continue to dominate the global cause-of-death structure, modern health interventions ranging from strengthening early-detection systems to ensuring equitable access to immunization and medical technology have successfully slowed the rate of mortality that was previously considered inevitable. This achievement serves as a key indicator in meeting the Sustainable *Sustainable Development Goal* (SDG) 3.4, which reflects the extent to which cross-border health policies are effective in protecting the working-age population from preventable health threats.

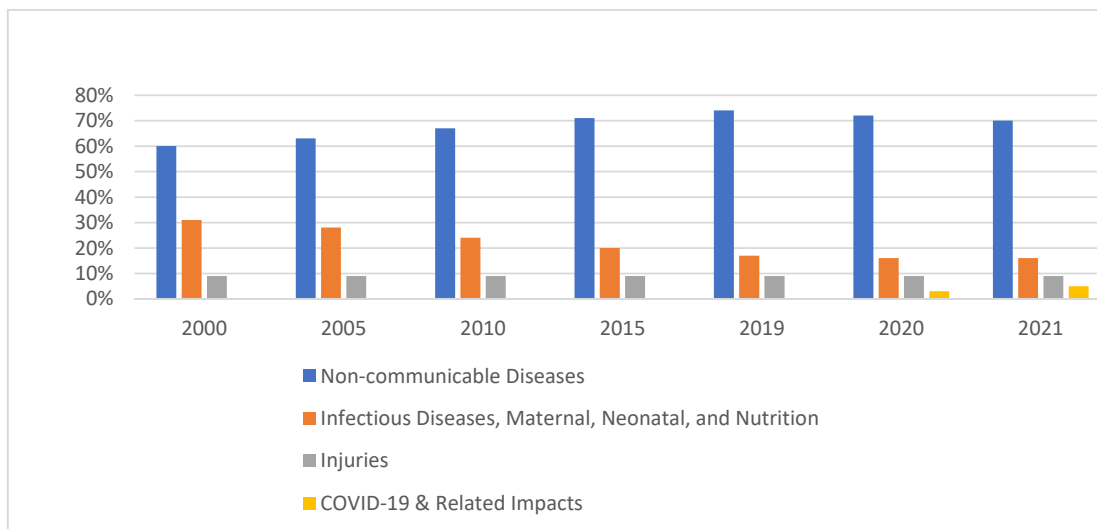


Figure 3. Chart of Causes of Death by Age Group Under 70
 Source: WHO (2025)

According to global health statistics, noncommunicable diseases (NCDs) saw a very significant increase in their contribution rising by 14% during the pre-pandemic period (2000–2019) with this figure steadily climbing from 60% to a peak of 74% in 2019. Although there were slight fluctuations in the percentage due to external factors, the NCD burden in 2021 remained at a very high level of 70% of total global deaths. This trend stands in stark contrast to the category of Infectious Diseases, Maternal, Neonatal, and Nutrition, which saw a drastic reduction of 14%, dropping from 31% in 2000 to just 16% in 2021. Meanwhile, the mortality rate from injuries has remained consistently stagnant at around 9%. A new challenge has emerged since 2020 with the introduction of the COVID-19 category and its associated impacts, which accounted for 5% of total global mortality in 2021.

3.3. The Role of Health Interventions in Reducing Premature Mortality

Health interventions play a strategic role in reducing premature mortality rates, particularly deaths occurring before the age of 70. Various efforts implemented globally focus on the prevention and control of major risk factors for mortality, particularly Noncommunicable Diseases (NCDs) such as cardiovascular disease, diabetes, cancer, and chronic respiratory diseases. Strengthening health policies, improving access to primary health care, and developing promotive and preventive programs are key components of strategies to reduce premature mortality.

Global data indicate that countries consistently implementing health interventions—including tobacco control, improved early detection of chronic diseases, and management of behavioral risk factors—tend to achieve more significant reductions in premature mortality rates. Health interventions emphasizing early diagnosis and treatment have proven effective in preventing disease complications that lead to death during productive years.

Furthermore, integrated and sustainable health interventions contribute to strengthening the health system as a whole, thereby enhancing a country’s capacity to respond to the disease burden more effectively. Thus, progress in health interventions not only impacts the reduction of premature mortality but also reflects improved health system performance in supporting the achievement of better public health outcomes.

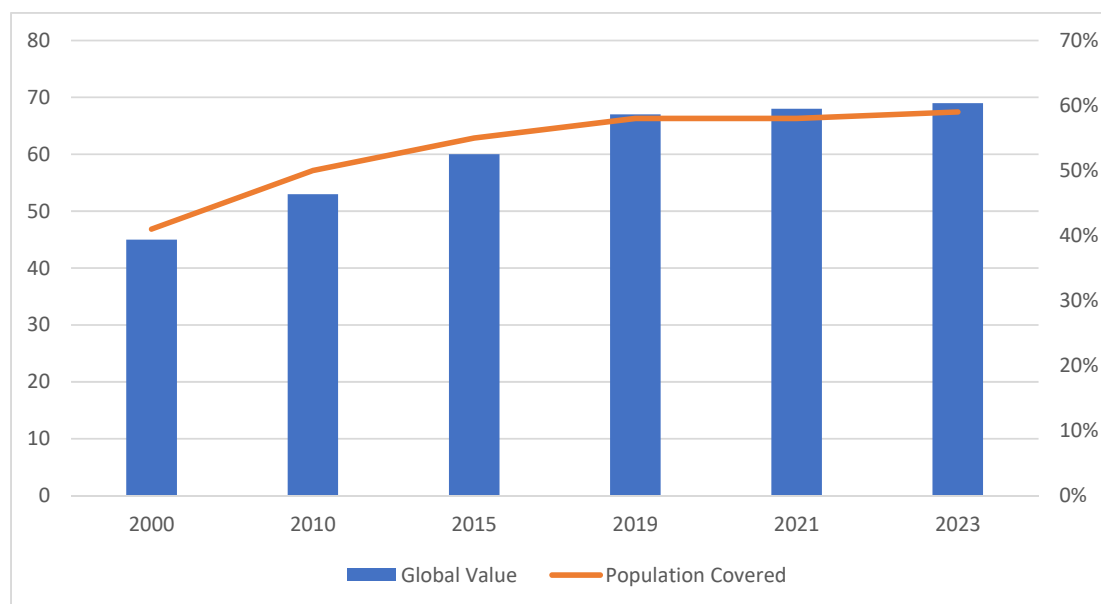


Figure 4. Access to Health Services (Universal Health Coverage/UHC) UHC Service Coverage Index
Source: WHO (2023)

The global UHC Service Coverage Index shows steady but uneven progress over the past two decades, reflecting global efforts to achieve universal health coverage as outlined in SDG 3.8. In 2000, the index stood at a low of 45 points, with only about 2.5 billion people (41% of the world's population) covered by essential health services such as immunization, maternal care, and treatment for infectious diseases, primarily due to infrastructure limitations in developing countries. Significant progress occurred in the 2000s, with the index rising to 53 points by 2010 (an 8-point increase), driven by global initiatives such as the Millennium Development Goals (MDGs) that expanded coverage to about 3.4 billion people (50%), including increased childhood vaccination and access to clean water in Asia and Africa.

In the mid-2010s, the momentum continued, with the index reaching 60 points in 2015 (up 7 points from 2010), at which point approximately 4 billion people (55%) had access to basic health services, thanks to programs such as the GAVI Alliance, which vaccinated hundreds of millions of children, and national health insurance reforms in countries like Thailand and Brazil. The pre-pandemic peak was reached in 2019 at 67 points (up another 7 points), covering approximately 4.5 billion people (58%), supported by the Sustainable Development Goals (SDGs) and a global decline in out-of-pocket expenditures.

However, the COVID-19 pandemic caused a temporary stagnation, with the index rising only slightly to 68 points in 2021 (up 1 point), while coverage remained at 4.5 billion people (58%) due to disruptions in health services, lockdowns, and the allocation of resources to emergency responses that reduced routine access such as immunization (down 2–5% in many countries). Post-pandemic recovery is evident in 2023, with the index reaching 69 points (up 1 point), covering approximately 4.6 billion people (59%), thanks to a rebound in mass vaccination and investments in digital health, although regional disparities—such as the gap of over 30 points between Europe (85) and Sub-Saharan Africa (58)—remain a major challenge toward the 80-point target by 2030.

Table 1. Global Data on Noncommunicable Disease Control Global Data (2019–2023)

Diseases	Deaths/Year	% of Total Deaths	Trend
Heart Disease	17.9 million	32%	↑2%
Stroke	6.6 million	11%	Stable
Cancer	10 million	18%	↑5%
Diabetes	1.6 million	3%	↑8%
COPD	3.2 million	6%	Stable
TOTAL NCDs	41 million	74%	↑4%

Source: World Health Statistics (2024).

Smoking bans and tobacco taxes have proven to be highly effective, as a 10% increase in cigarette taxes can reduce consumption by up to 4%, thereby protecting 3 billion people from secondhand smoke—since smoking causes 8 million deaths annually—and these bans and taxes encourage 20–30% of smokers to quit, thereby reducing rates of heart disease and cancer by 15% in successful countries like Australia, which implements graphic health warnings on cigarette packaging and high taxes. Additionally, promoting healthy eating with a 30% reduction in salt has successfully reduced strokes by up to 10%, while nutrition labels on food packaging have reduced obesity by 5%, as fast food is the primary cause of diabetes, which has risen by 8% globally; thus, governments that limit sugar in sugary drinks can prevent 1.6 million new cases of diabetes and saving up to 300 billion U.S. dollars in medication costs through school education campaigns and food industry regulations.

Furthermore, the recommendation for 150 minutes of exercise per week addresses the issue of 1.4 billion people being physically inactive—a factor contributing to 5 million premature deaths—by reducing the risk of heart disease by up to 30%. Simple, free activities like walking or jogging effectively prevent obesity, especially when taught in schools, ensuring children grow up healthy into adulthood and saving up to 50 billion dollars in global healthcare costs through the development of urban parks and community programs. Meanwhile, early screening such as mammograms for breast cancer detects 80% of cases in the early stages, and HbA1c tests control diabetes by up to 70%, these free annual tests can save 3.7 million lives at a cost of just \$20 per test compared to \$20,000 for advanced-stage treatment, making them the most cost-effective and accessible interventions at community health centers or clinics (Ezzati & Riboli, 2013).

Finally, affordable medications like aspirin, statins, and metformin—costing just \$0.50 per day—prevent 75% of heart attacks by lowering cholesterol by 40% and blood pressure by 20%. The WHO distributes these free to 100 million poor people, allowing patients to live normal lives without high costs and significantly reducing the burden on hospitals. The overall results of these interventions are evident in successful countries like Japan and South Korea, where NCD deaths have dropped by 20% from 2010 to 2023, with life expectancy reaching 84 years, saving 7 trillion dollars annually globally while saving 7 million lives each year toward the goal of a 30% reduction in NCD deaths by 2030, which aligns perfectly with your graph, where NCDs dominate the elderly population over 70 years old post-2021 because COVID interventions protected younger age groups, while NCDs naturally increase with age—making a healthy lifestyle plus screening the key, where every 1 dollar invested yields 7 dollars in healthcare cost savings according to the WHO.

4. BATIK MOTIF MODELS BASED ON MATHEMATICS AND PHILOSOPHY

This motif can be seen as a convergence of data and culture. The lines of graphs typically used to interpret numbers such as trends in life expectancy and access to healthcare are rotated and arranged radially to form a pattern resembling a batik flower. From something cold and numerical emerges a vibrant, symmetrical form. Symbolically, the dot at the center can be interpreted as the center of human life or societal well-being. From that center, the graph lines radiate in various directions like petals. This illustrates that improvements in health, social well-being, and access to healthcare do not stand alone, but develop together and influence one another.

The repeating petals symbolize the consistency of global progress. Statistical data, typically presented as time-series trends, is transformed into a repeating pattern, indicating that human progress occurs through a continuous, layered process. Meanwhile, the graph lines that remain visible as data lines serve as a reminder that behind the beauty of these patterns lies the reality of numbers: life expectancy figures, premature mortality rates, and access to healthcare services. In other words, this motif seeks to demonstrate that data is not merely numbers, but a reflection of humanity's journey toward a healthier and more prosperous life. When interpreted on a deeper level, this motif can be seen as a symbol that science and culture can complement one another. Statistics provide an understanding.

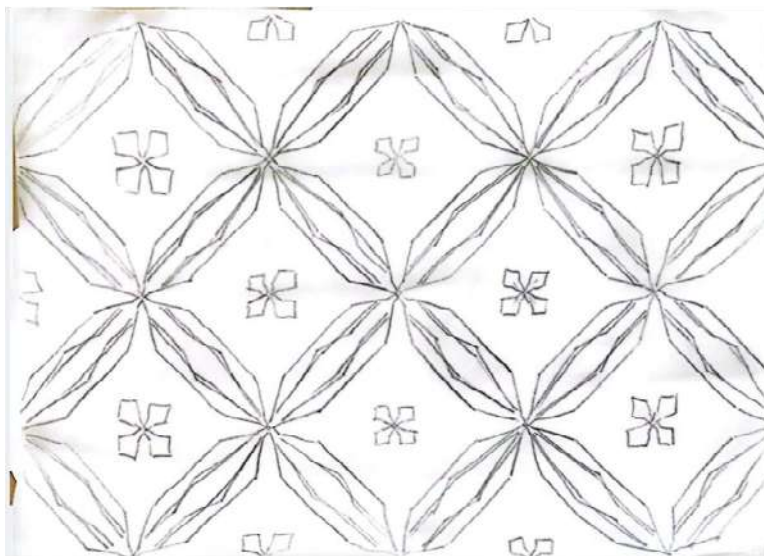


Figure 5. Mathematics Based Batik Pattern Applied on Paper

5. CONCLUSION

Premature mortality remains a significant global health issue, particularly in low- and middle-income countries. Although global life expectancy shows a long-term upward trend, high mortality rates before the age of 70—especially due to noncommunicable diseases (NCDs)—continue to contribute significantly to the global burden of mortality and reflect regional disparities.

Health interventions play a crucial role in reducing premature mortality through the control of key risk factors, the strengthening of primary health care services, and the implementation of promotive and preventive measures. Regions capable of consistently implementing health interventions tend to demonstrate greater reductions in premature mortality rates, while simultaneously supporting increases in life expectancy.

Based on 2025 data from the World Health Organization, efforts to reduce premature mortality require the strengthening of integrated and equitable health interventions. A focus on

the prevention and control of NCDs is key to accelerating the achievement of global health targets and improving the quality of life for people worldwide.

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