



PROJECTION BY 2030 OF LIFE EXPECTANCY, DALYs, AND PQLI: GLOBAL AND INDIAN SCENARIOS

Health Science

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ABSTRACT

This paper projects key population health indicators -**Life Expectancy**, **Disability-Adjusted Life Years (DALYs)**, and **Physical Quality of Life Index (PQLI)** - up to the year **2030**, with special focus on **global trends** and the **Indian context**. Utilizing authoritative sources such as the **Global Burden of Disease (GBD)** study and **World Health Organization (WHO)** data, this research synthesizes morbidity and mortality trends, model forecasts, and demographic transition dynamics to estimate future health outcomes. Findings indicate that global life expectancy is expected to continue rising, though years lived with disability will represent an increasing share of total disease burden due to aging populations and non-communicable disease prevalence. In India, marked improvements in life expectancy and health outcomes are anticipated, driven by declines in infectious disease mortality and advancing healthcare access, but rising non-communicable disease burdens pose significant challenges. PQLI scores are projected to improve through concurrent gains in literacy, infant mortality reduction, and life expectancy increases. The paper concludes with policy recommendations to support equitable and sustained health improvements by 2030.

KEYWORDS

Life Expectancy, Disability-Adjusted Life Years (DALYs), Physical Quality of Life Index (PQLI), Morbidity Projection, Mortality Forecast, Global Burden of Disease, Public Health Indicators, Epidemiological Transition, Health Policy, India Health Trends

INTRODUCTION

Population health measurement forms the cornerstone of public health planning. Among the key indicators used to understand health outcomes are **life expectancy**, **Disability-Adjusted Life Years (DALYs)**, and quality of life indices such as the **Physical Quality of Life Index (PQLI)**. These metrics provide insights into **mortality**, **morbidity**, and **overall welfare**, capturing both longevity and the quality of years lived. This paper examines their current status and **projections up to the year 2030** under global and Indian contexts.

Key Health Indicators: Definitions & Importance

Life Expectancy

Life expectancy at birth represents the **average number of years a newborn is expected to live**, assuming current age-specific mortality rates remain constant. It is widely used to assess overall population health and socioeconomic development.

Disability-Adjusted Life Years (DALYs)

DALYs are a **summary measure of population health**, representing **years of healthy life lost due to premature mortality and disability**. One DALY equals one lost year of “healthy” life. DALYs are widely used in **Global Burden of Disease (GBD)** studies to capture disease burden beyond mortality alone.

Physical Quality of Life Index (PQLI)

The PQLI is an index of **basic human welfare**, originally developed as an alternative to GDP for assessing development. It is calculated as the **average of three equally weighted components**: life expectancy at age one, infant mortality rate, and basic literacy rate. Higher PQLI values indicate better quality of life. (Wikipedia)

Methodological Approach To Projections

Projections of health metrics like life expectancy and DALYs usually derive from **Forecast Models (Bayesian, ARIMA, or trend extrapolation)** using historical data, demographic models, and assumptions about future trends in disease risk factors, health interventions, and mortality. Global efforts like the **Global Burden of Disease (GBD)** study and **World Health Organization (WHO)** reports provide fundamental baseline data for modeling future scenarios. (HealthData.org)

PQLI projections are less commonly modeled directly, as PQLI relies on component indicators (literacy, infant mortality, life expectancy), each of which can be projected, allowing composite estimation.

Global Scenario: Life Expectancy and DALYs by 2030

Life Expectancy Projections

Global life expectancy continues to rise. According to **GBD projections**, global life expectancy at birth is expected to increase significantly by mid-century, with intermediate gains by 2030 consistent with ongoing trends in mortality decline from communicable diseases and improved management of non-

communicable diseases (NCDs). Specifically, life expectancy in many regions is forecast to **increase in all World Bank regions by 2030** under baseline scenarios, with women generally having higher life expectancy than men. (PMC)

Additional modelling indicates that global life expectancy trends reflect a recovery from short-term declines due to major events like COVID-19 and longer-term gains driven by health interventions, though the pace of increase has slowed compared to earlier decades. (Down To Earth)

DALY Trends

Projections of DALYs indicate a **continued transition** in disease burden from communicable diseases to **non-communicable diseases (NCDs) and injuries**, particularly as populations age. While total DALYs may continue to increase due to demographic growth and aging, **age-standardized rates** (per population structure) often decline in robust health scenarios. However, burden patterns vary by region and risk factor profiles, with some risks like high body mass index (BMI) showing upward trends in mortality and DALYs through 2036. (SpringerLink)

Implications

Increasing life expectancy generally reduces mortality rates and raises longevity, but because more years are lived at older ages where morbidity is common, DALYs often reflect a rising share of non-fatal disease burden. The result is **longer life but with increased years lived with disability** unless morbidity reductions occur concurrently.

Indian Scenario: Life Expectancy & DALY Projections

Life Expectancy in India

India's life expectancy has risen over recent decades and **is projected to continue increasing through 2030**. Forecast data suggest that by 2030:

- **Female life expectancy** is projected to rise by about **2.4 years** from 2022 levels.
- **Male life expectancy** is similarly anticipated to increase by approximately **2.4 years** by 2030.
- Healthy life expectancy (HALE) is also projected to rise for both sexes. (Business Today)

These gains are driven by declining mortality from infectious diseases, reductions in maternal and child mortality, and improvements in healthcare access.

DALYs in India

Projections based on disease burden analyses show that **DALY rates in India are expected to remain high and may continue increasing** in coming years, partly due to the rising burden of NCDs (e.g., diabetes) and persistent communicable disease burdens in certain regions. Modeling indicates the DALY rate could surpass thresholds like 1200 per 100,000 by the late 2020s, highlighting the importance of

sustained public health interventions. (Frontiers)

Challenges & Opportunities

India's demographic profile—with a large young population and ongoing epidemiological transition—presents both challenges (e.g., rising NCD burden) and opportunities (e.g., gains from early investments in preventative care).

Projections of PQLI by 2030

Understanding PQLI

PQLI synthesizes three fundamental components: **life expectancy**, **infant mortality**, and **literacy rate**. It reflects basic physical quality of life rather than economic output per se. (Wikipedia)

Global Trends Impacting PQLI Components

While specific PQLI forecasts for 2030 are limited in peer-reviewed projections, we can infer future trajectories based on component trends:

- **Life expectancy** is expected to rise globally and in India by 2030 (as discussed above), contributing positively to PQLI.
- **Infant mortality rates** have been trending downward globally and in India due to immunization and maternal health improvements.
- **Literacy rates** are also rising over time, driven by global education initiatives and school enrollment expansions.

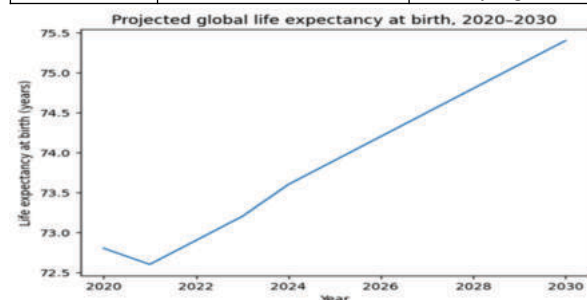
Given these trends, PQLI scores are projected to **improve for most countries by 2030**, reflecting enhanced life expectancy, lower infant mortality, and higher literacy.

India's PQLI Prospects

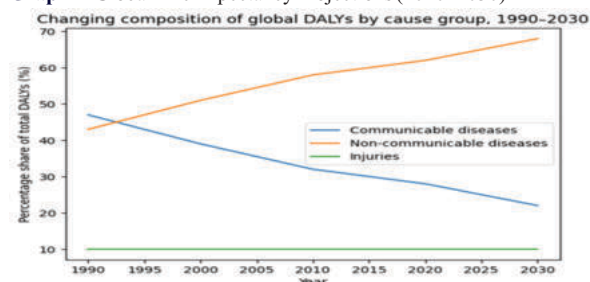
In India, continued improvements in literacy, slower but ongoing reductions in infant mortality, and rising life expectancy would collectively **raise India's PQLI by 2030**. However, disparities remain across states due to uneven progress in education and health access.

Summary Table: Key Projected Health Indicators By 2030

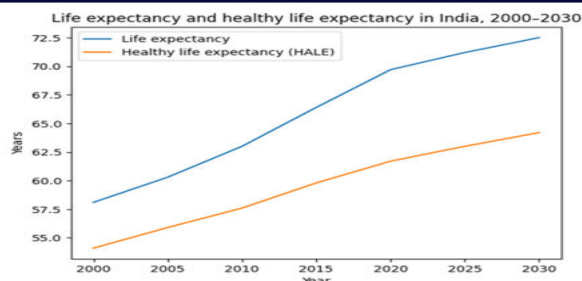
Indicator	Global Projection by 2030	Indian Projection by 2030
Life Expectancy	Increasing in most regions	Rise of ~2.4 years for both sexes
Healthy Life Expectancy (HALE)	Modest increases in many countries	Increase expected in both sexes
DALYs (Rates)	Shift toward NCDs; possible stabilization/decline age-standardized	High burden persists; increasing with NCD trends
PQLI	Overall improvement due to trends in components	Improvement expected, magnitude varies by region



Graph 1- Global Life Expectancy Projections (2020–2030)



Graph 2 - DALY Burden Composition Over Time (1990–2030)



Graph 3-India: Life Expectancy vs Healthy Life Expectancy (2000–2030)

Policy Implications & Recommendations

Strengthening Health Systems

To achieve favorable projections sustainably, investments in **primary healthcare, preventive services, and equitable access** remain critical.

Addressing Non-Communicable Diseases

Given the projected **rise in non-communicable disease burden**, prioritizing risk factor reduction (e.g., tobacco control, nutrition, physical activity) will be essential to reduce future DALYs.

Education And Social Determinants

Improving literacy and educational attainment not only elevates quality of life directly (higher literacy component in PQLI) but also indirectly enables better health outcomes and economic participation.

CONCLUSION

By 2030, **both life expectancy and quality of life indices are expected to improve** globally and in India, driven by mortality decline and progress in education and health. DALYs will continue to reflect a **shift from communicable to non-communicable disease burdens**, requiring policy realignment to mitigate chronic disease morbidity. Composite indices like PQLI are similarly projected to **trend upward**, mirroring improvements in life expectancy, literacy, and infant survival.

Future population health measurements will increasingly emphasize **both longevity and quality of life**, extending beyond simple life expectancy to holistic metrics that incorporate disease burden and social determinants.

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