Epidemiological Transition

By Hana Taha

Aging world

- The world’s population is getting older, with 10% ages 65+ in 2024. That’s 800 million people
- Between 2015 and 2050, the proportion of the world's population over 60 years is expected to increase from 12% to 22%.
- By 2050, the world’s population of people aged 60 years and older will be around 2.1 billion.
- The number of persons aged 80 years or older is expected to triple by 2050 and reach 426 million.

WHO forecasts

Aging world

- While this shift in distribution of a country's population towards older ages – known as population ageing – started in high-income countries (for example in Japan 30% of the population is already over 60 years old)
- Now low- and middle-income countries are experiencing the greatest change.
- In 2050, 80% of older people will be living in low- and middle-income countries.
- Is an aging world something to be concerned about? No. It’s something to plan for.
- All countries face major challenges to ensure that their health and social systems are ready to cope with the anticipated demographic shift.

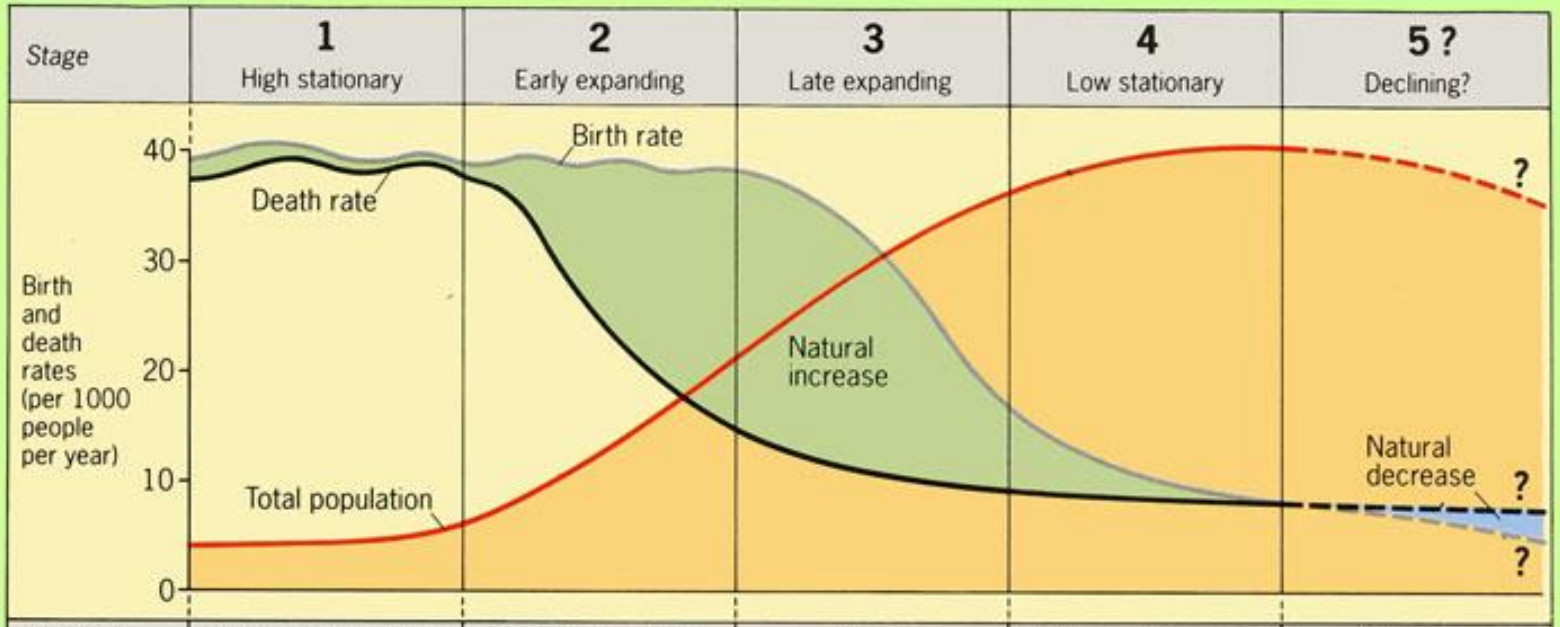
Aging world

- Population aging poses challenges such as shifts in the burden of disease to include more chronic diseases such as hypertension and diabetes and a higher demand for caregiving.
- Primary health care (PHC) includes preventive measures that are crucial in delaying the onset of age-related diseases and maintaining older adults' health. It also helps reduce the long-term burden on health systems.

The demographic transition Model

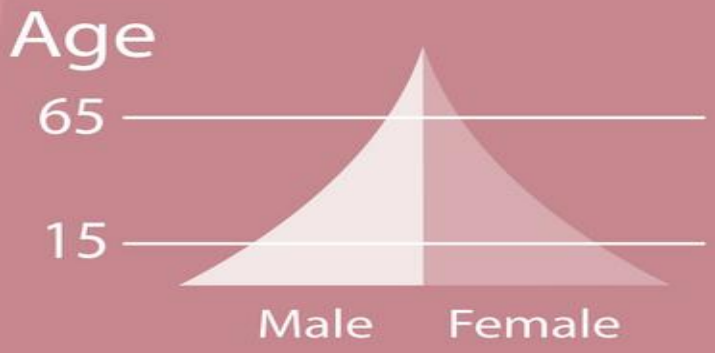
- The demographic transition Model is used to represent the transition from high birth and death rate to low birth and death rates as a country develops from a pre-industrial to an industrialized economic system
- It is a useful way of determining the economic development of a country using their demographic statistics.
- **STAGE 1 -** Both the birth and death rate is high. Population growth is low and fluctuating.
- **STAGE 2 -** The birth Rate remains high. The death Rate is falling. Population growth is high.
- **STAGE 3 -** The birth Rate starts to fall. The death Rate continues to fall. Population growth is moderate.
- **STAGE 4 -** Both the birth and death rate is low. Population growth is very low.
- **STAGE 5 -** The birth rate is falling slightly. Death rate is steady. Decline in population (slow decrease).

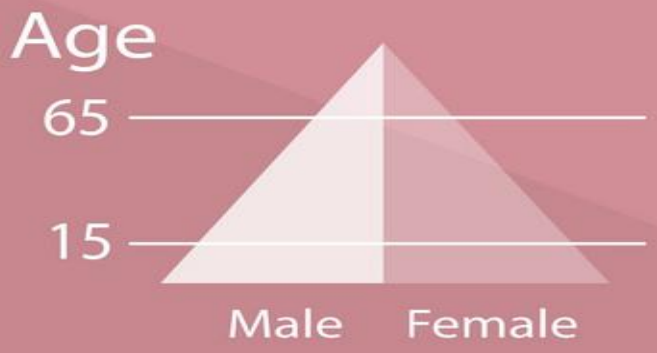
Demographic Transition Model

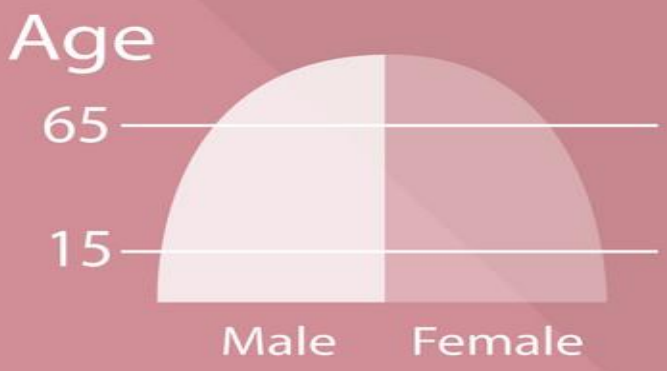


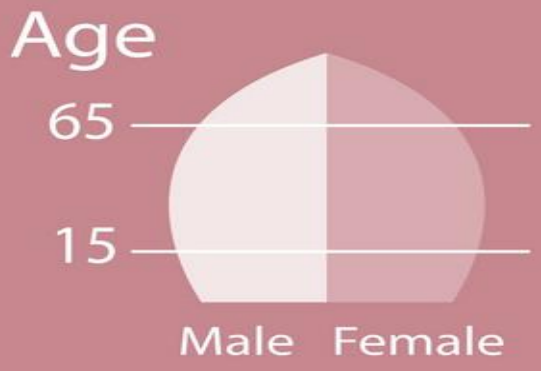
Stage	1 High stationary	2 Early expanding	3 Late expanding	4 Low stationary	5 ? Declining?
Examples	A few remote groups	Egypt, Kenya, India	Brazil	France and UK	Germany
Birth rate	High	High	Falling	Low	Very low
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Stable or slow increase	Slow decrease
Reasons for changes in birth rate	Many children needed for farming. Many children die at an early age. Religious/social encouragement. No family planning.		Improved medical care and diet. Fewer children needed.	Family planning. Good health. Improving status of women. Later marriages.	
Reasons for changes in death rate	Disease, famine. Poor medical knowledge so many children die.	Improvements in medical care, water supply and sanitation. Fewer children die.		Good health care. Reliable food supply.	

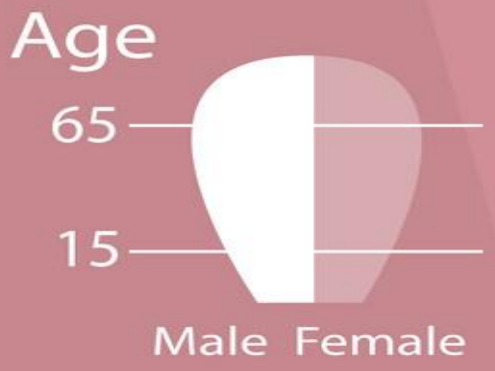
POPULATION PYRAMID SHAPES











POPULATION PYRAMID SHAPES

Demographic Transition Model

Stage 1 - High birth rate. Rapid fall in each upward age group due to high death rates. Short life expectancy.

Stage 2 - Still high birth rate. Fall in death rate as more living in middle age. Slightly longer life expectancy.

Stage 3 - Declining birth rate and declining death rate. More people living to an older age.

Stage 4 - Low birth rate and low death rate. High proportion of dependents. Longer life expectancy.

Stage 5 - Birth rate is less than the death rate, increasing old age. Population is declining

What is epidemiology?

- **Epidemiology is** a branch of medical science that studies the distribution of DISEASE in human populations and the factors that determines its distribution, principally by using STATISTICS.

THE EPIDEMIOLOGIC TRANSITION

- 1971, Abdel Omran
- The Epidemiologic transition theory describes the stages of development that are characterized by a shift in population growth, life expectancy and disease patterns.
- It describes the process by which the pattern of mortality and disease is transformed from one of high mortality among infants and children, episodic famine and epidemic affecting all age groups to one of degenerative and man-made diseases (such as those attributed to smoking) affecting principally the elderly.

Epidemiological transition

- Running over timescales that span decades or centuries
- Reduction in mortality is followed by a reduction in fertility
- Increased proportion of aging population
- Less malaria, diarrhoeal diseases, TB and HIV/AIDS
- More non-communicable diseases; cardiovascular diseases, cancer, COPD, road traffic accidents and diabetes mellitus
- Changes in burden of disease from communicable to non-communicable diseases.

Stages of Epidemiologic Transition

Stage I: Pestilence and Famine

- Infectious and parasite diseases were principle causes of death along with accidents and attacks by animals and other humans.
- Most violent Stage I epidemic was the Black Plague(black death) probably transferred to humans by fleas from infected rats.
- 25 million Europeans died between 1347 to 1350.

Stage II: Receding Pandemics

- Improved sanitation, nutrition, and medicine during the Industrial Revolution reduced the spread of infectious diseases.
- Death rates did not improve immediately and universally during the early years of the Industrial Revolution.
- Poor people who crowded into Industrial Cities had high death rates due to cholera, due to acute diarrhea and vomiting that can kill within hours if left untreated.

Stage III: Degenerative Diseases

- Associated with the chronic diseases of aging
- Cardiovascular diseases and cancer
- Sub-Saharan Africa and South Asia have low incidences of cancer primarily because of low life expectancy.

Stage IV: Delayed Degenerative

- Life expectancy of older people is extended through medical advances.
- Cancer medicines, bypass surgery and better diet.
- Consumption of non-nutritious food and sedentary behavior have resulted in an increase in obesity in this stage.

Stage V

- Reemergence of infectious and parasitic diseases; diseases thought to have been eradicated or controlled return, and new ones emerge

3 Possible Reasons for Stage V

- Evolution – new strains due to drug resistance (malaria)
- Poverty- more infections due to unsanitary conditions (TB)
- Increased globalization – spread through relocation diffusion (H1N1/swine, severe acute respiratory syndrome (SARS) and COVID-19.

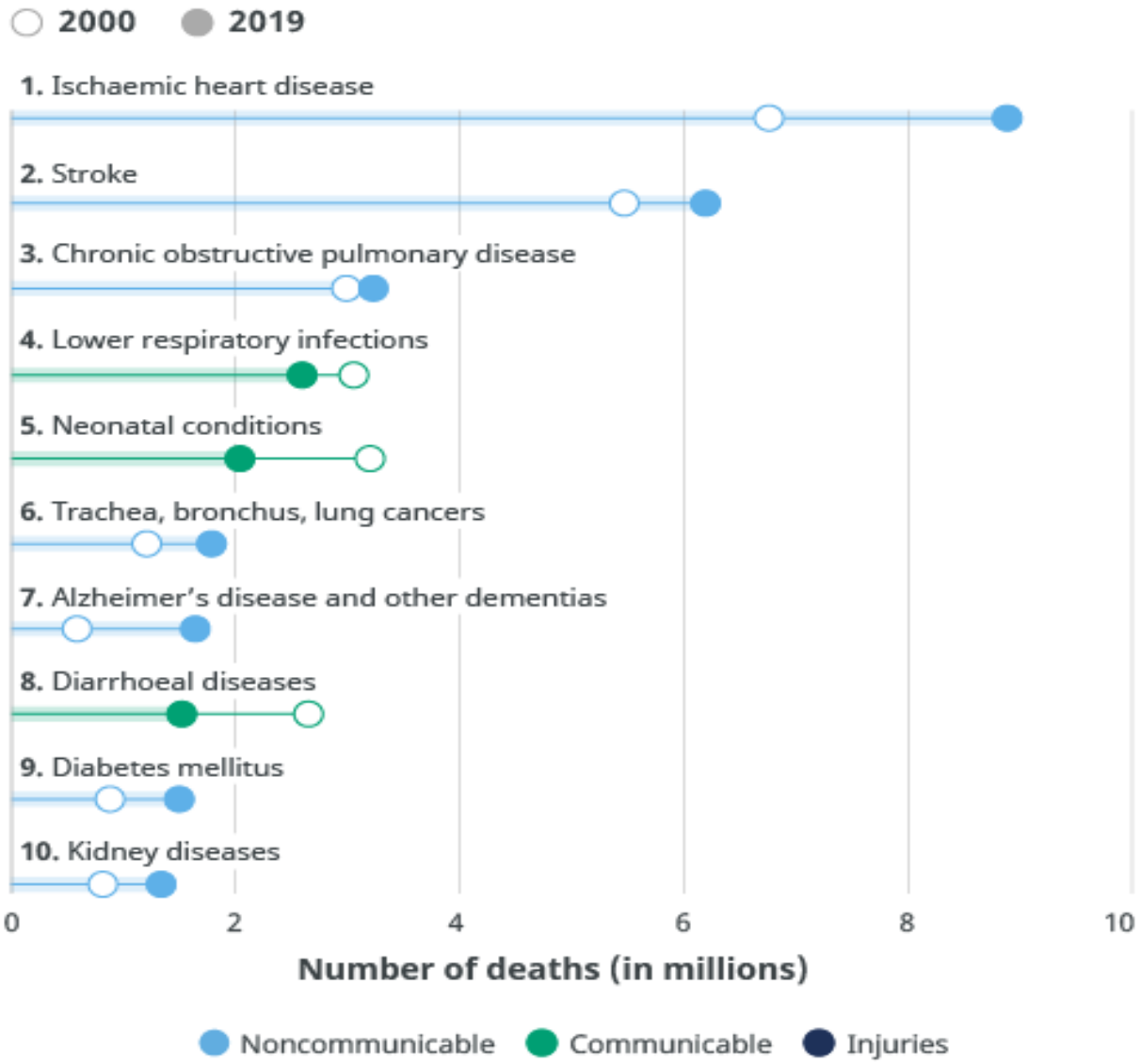
Epidemiologic Transition

THE EPIDEMIOLOGIC TRANSITION

This shift is caused by:

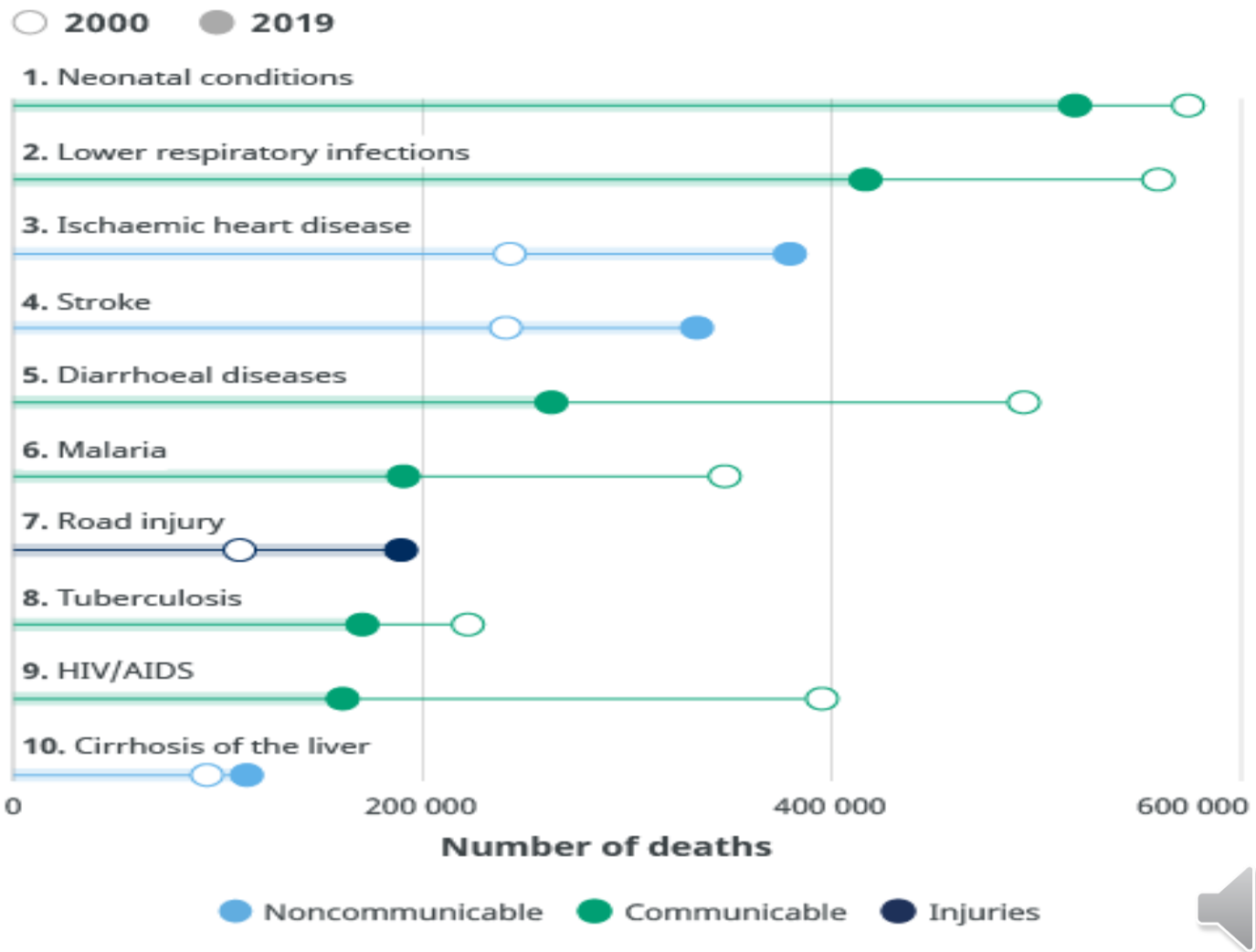
- The aging of the population, because non-communicable diseases affect older adults at the highest rates
- Improvements in medical care, which mean that children no longer die from malnutrition or from easily curable conditions such as diarrhea.
- public health interventions such as vaccinations and the provision of clean water and sanitation, which reduce the incidence of infectious diseases.
- This pattern can be observed across many countries, with wealthy countries further advanced along this transition.

Leading causes of death globally



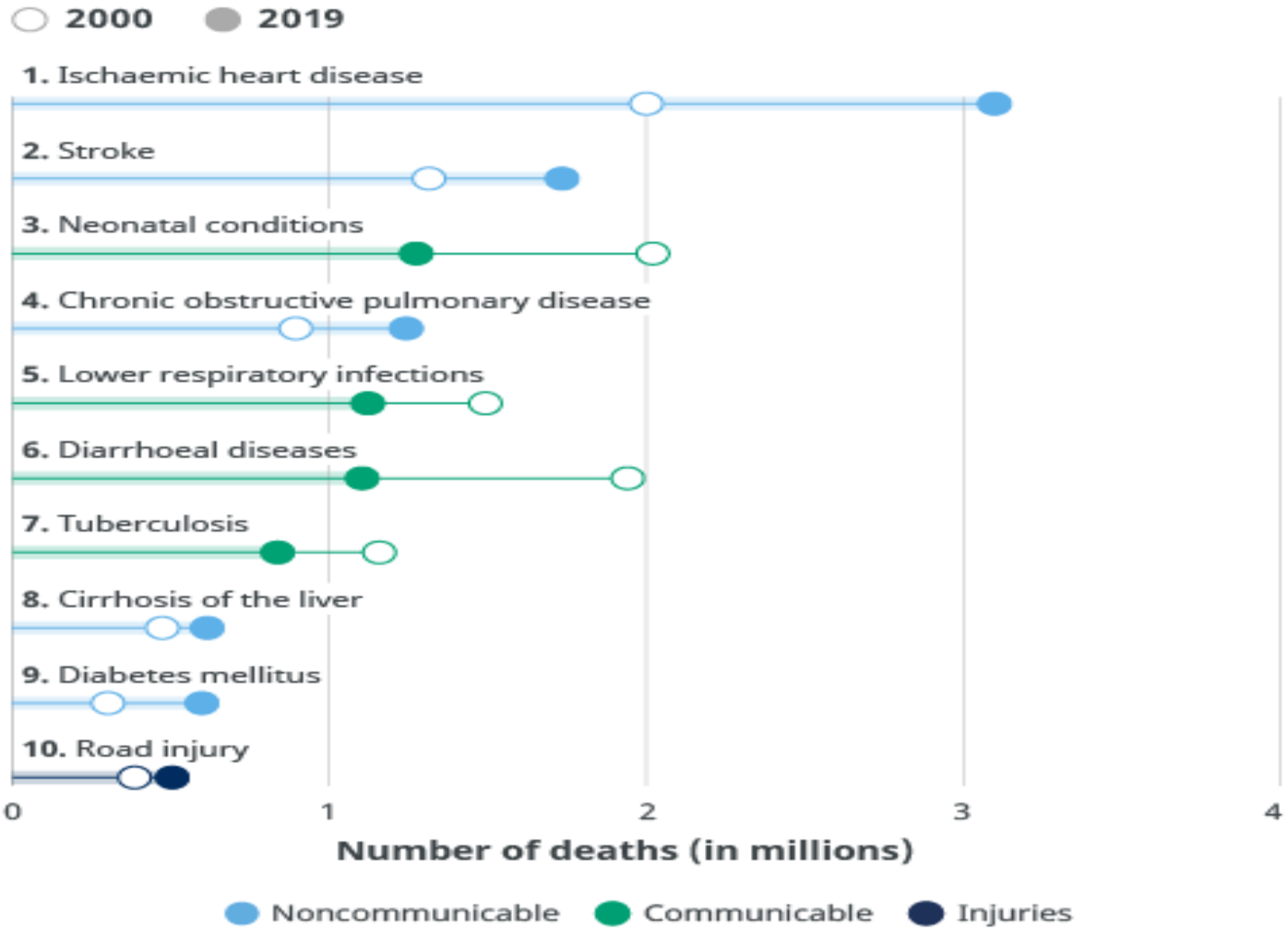
Source: WHO Global Health Estimates.

Leading causes of death in low-income countries



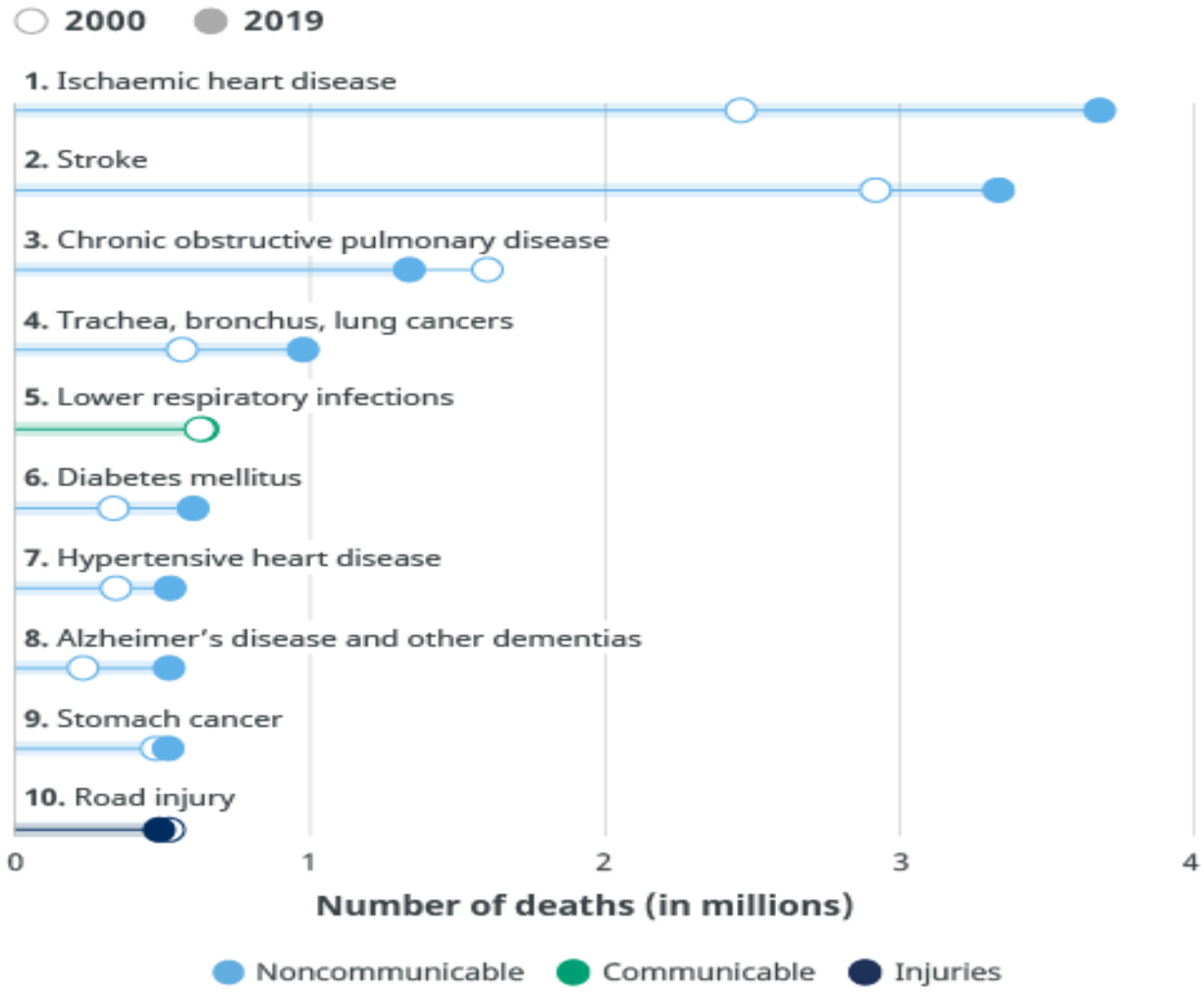
Source: WHO Global Health Estimates. Note: World Bank 2020 income classification.

Leading causes of death in lower-middle-income countries



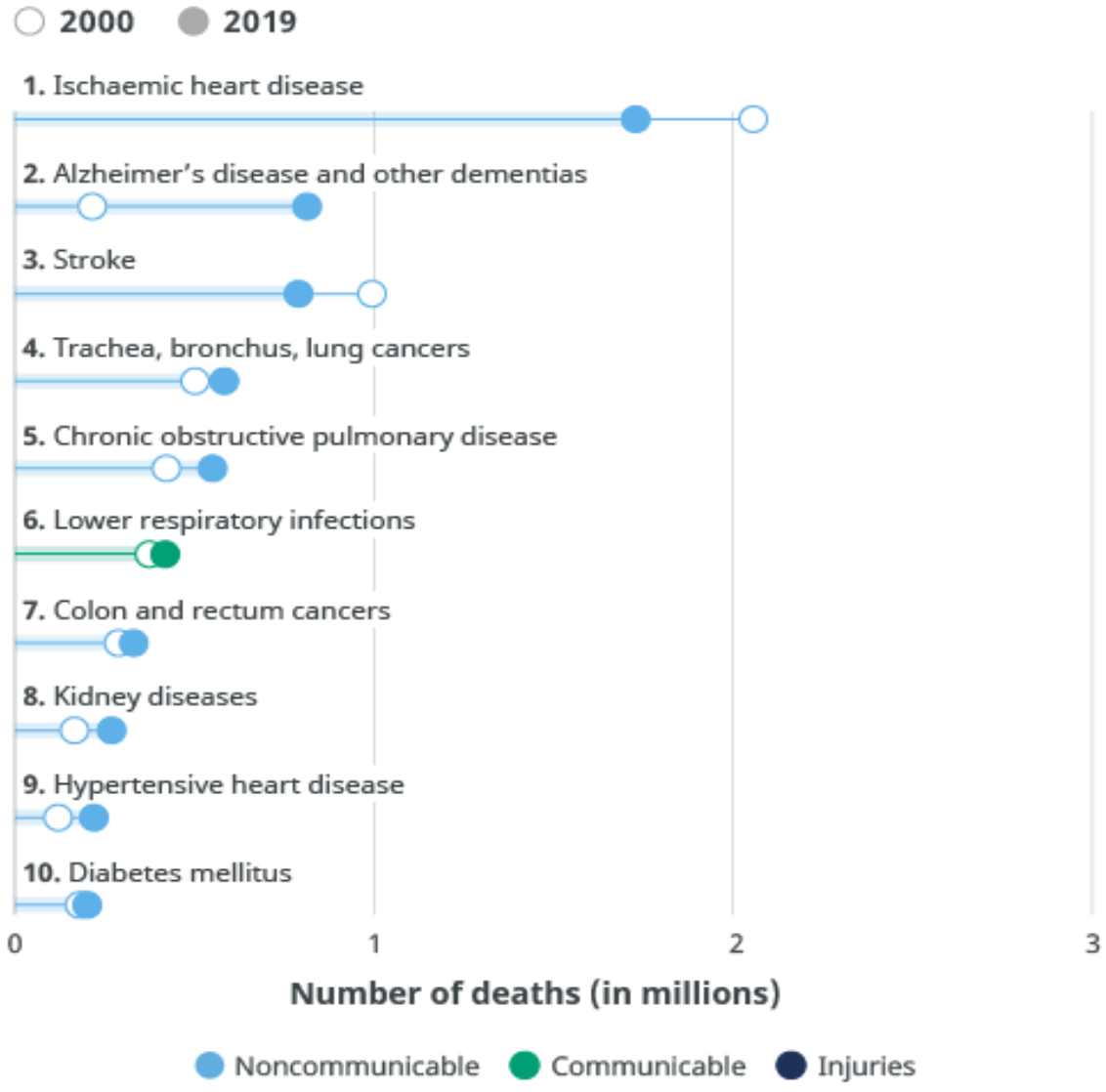
Source: WHO Global Health Estimates. Note: World Bank 2020 income classification.

Leading causes of death in upper-middle-income countries



Source: WHO Global Health Estimates. Note: World Bank 2020 income classification.

Leading causes of death in high-income countries



Source: WHO Global Health Estimates. Note: World Bank 2020 income classification.

PRIMARY HEALTH CARE

- About 50% of the world's population lacks access to good primary health care.
- PHC is a platform for integrated health service delivery to meet people's changing needs at every age: such as pregnancy care, childhood immunizations, and care for noncommunicable diseases like high blood pressure (hypertension).
- PHC supports people to live longer, healthier lives

PRIMARY HEALTH CARE

- Investments to scale up access to quality PHC across low- and middle-income countries can prevent as many as 60 million deaths by 2030 and average life expectancy could increase by 3.7 years.
- To realize this, we must ensure quality PHC that is centered on people and is continuous, comprehensive, and coordinated to meet their evolving health needs at all stages of life.

- WHO, World Health Statistics 2024