



# Burden of disease



**DALYs & QALYs**

OSMOSIS.org

# COST of illness



Part 2

Dr. Omnia Elmahdy

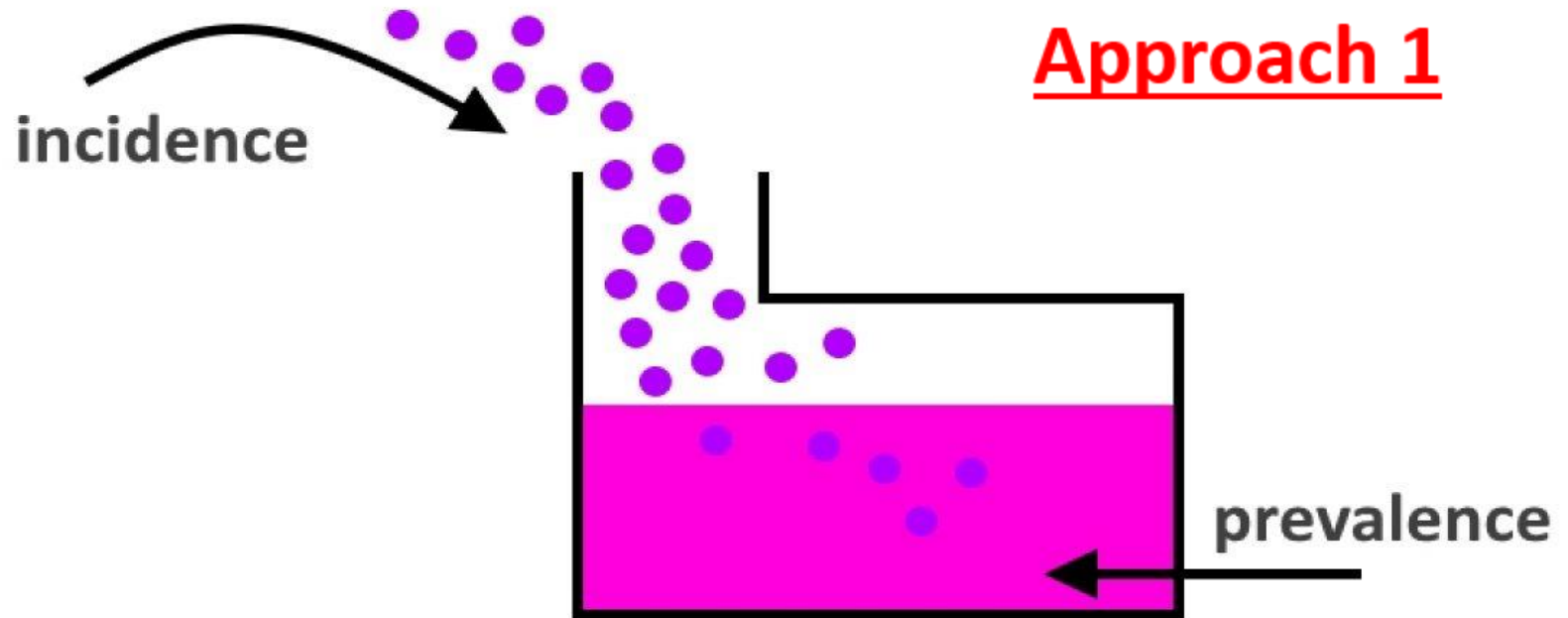
Incidence

Prevalence

death / cure



There are a number of approaches and indicators used to assess the burden of illness



## Approach 1

The prevalence of a disease is used to estimate the costs for that disease during a period of time  
(Direct and Indirect costs)

**Prevalence** is a measure of the burden of disease in a population in a given location and at a particular time, as represented in a count of the number of people affected, which is required to plan appropriately for their health care needs.

# point prevalence

***the amount of people who have a disease over the total amount of people in the population***

- Prevalence (%) =

$$\frac{\text{number of people with disease}}{\text{number of people in the population}} \times 100\%$$

## Diabetes in Jordan (2021)

**5,854,100**

Total adult population

Calculate : the point prevalence????

**866,500**

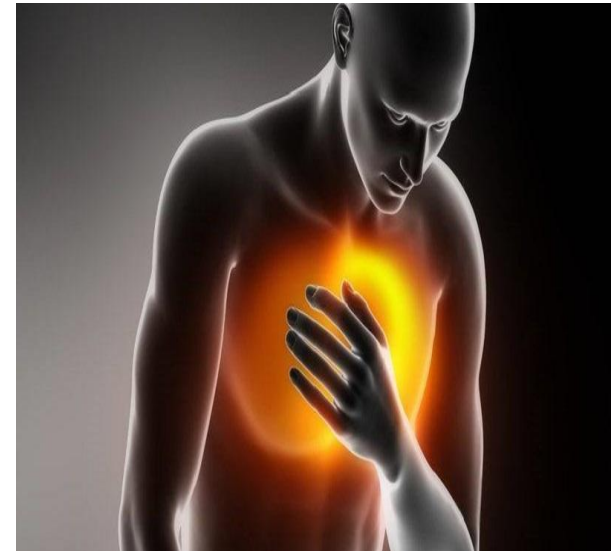
Total cases of diabetes in adults

- **Example:** Suppose 5500 persons aged 60+ years in a town and 700 cases of coronary artery disease were found among them, the prevalence of CAD in that town at that time would be:

The cost of coronary artery disease in the UK was estimated by using the number of prevalent cases and data relating to mortality, morbidity and health service utilization. +

In addition, a societal perspective was employed by including both direct and productivity costs.

The direct health care costs were estimated at £1.8 billion and the productivity costs of the disease were estimated at £6.7 billion.



Another example is taken from the condition **asthma** **and its management.**

In a study, it was estimated that **5.1 million people** of all ages and social backgrounds were being treated for asthma in the UK (including 1.4 million children under 16 years of age) at a total **annual cost** to the UK health care system of **over £850 million.**

However, it is not the costs directly related to treatment that contribute the largest proportion to overall cost, but rather the costs of inappropriate treatments and non-compliance عدم الالتزام بالعلاج that result in suboptimal control تحكم ضعيف بالمرض and an excessive number of attacks resulting in hospitalizations.





## Approach 2

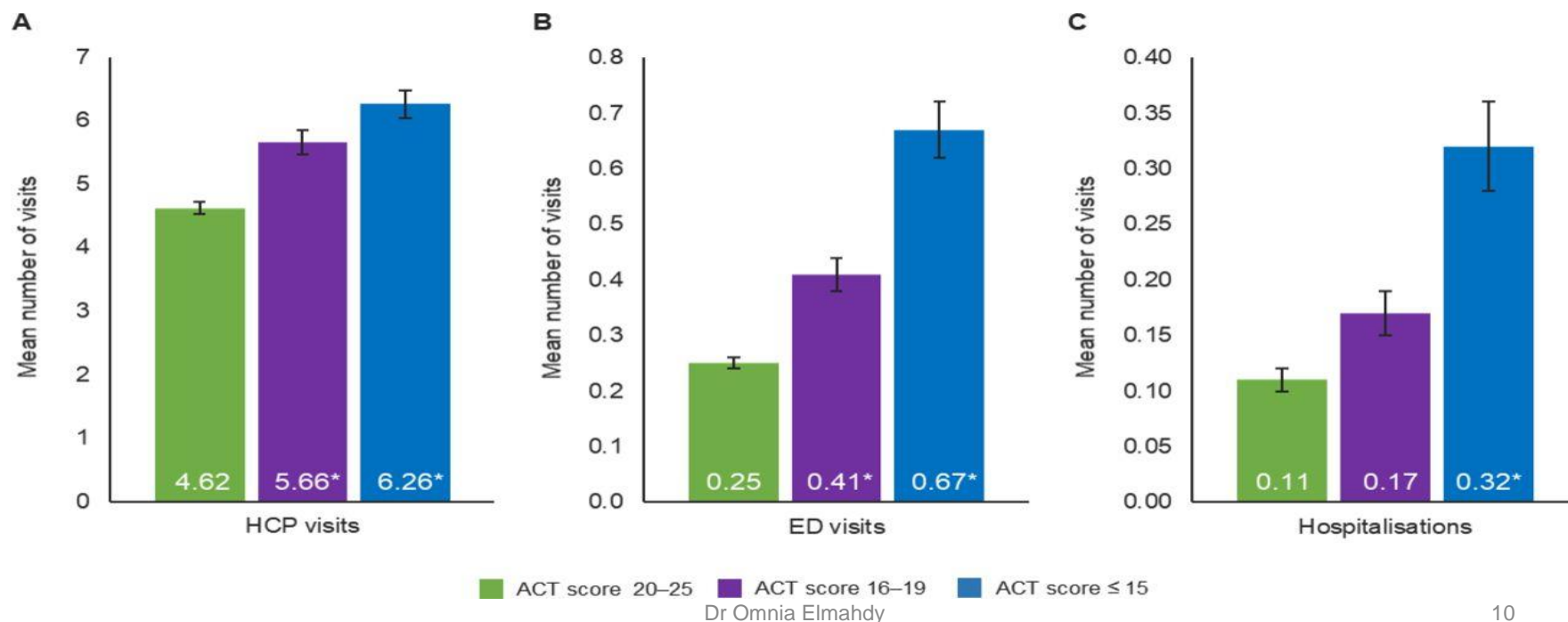
Another method employed has been to calculate the impact of disease on resources

(Cost of appointment time, cost of GPs time for the illness, cost of resources utilized for the illness)

It was estimated that primary care management of patients with chronic pain accounts for **4.6 million appointments** per year in the UK, equivalent to **793 whole-time GPs**, at a **total cost** of around **£69 million**

# Example

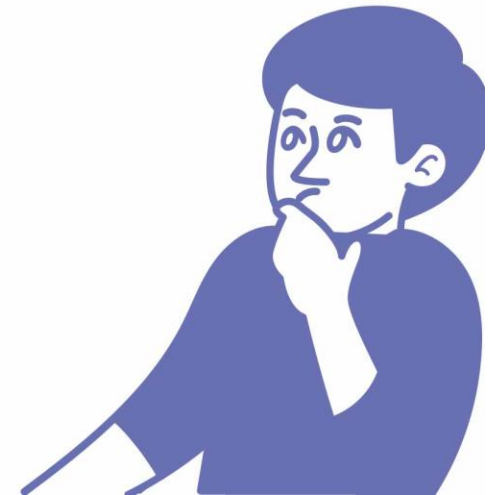
- In a US study (2016) on 7820 eligible asthma adult patients, **well-controlled** asthma (Asthma Control Test, ACT score **20–25**) compared with **partly controlled** (ACT score **16–19**) or **poorly controlled** asthma (ACT score **≤15**)



## Approach 3

The WHO approach to estimating the **burden of disease** is to calculate the impact of illness on disability-adjusted life years (DALYs) and quality-adjusted life years (QALYs)

WHAT ARE  
**DALYs**  
AND  
**QALYs?**



# (Disability Adjusted Life Years)

**DALYs** is for quantifying the burden of disease from mortality and morbidity

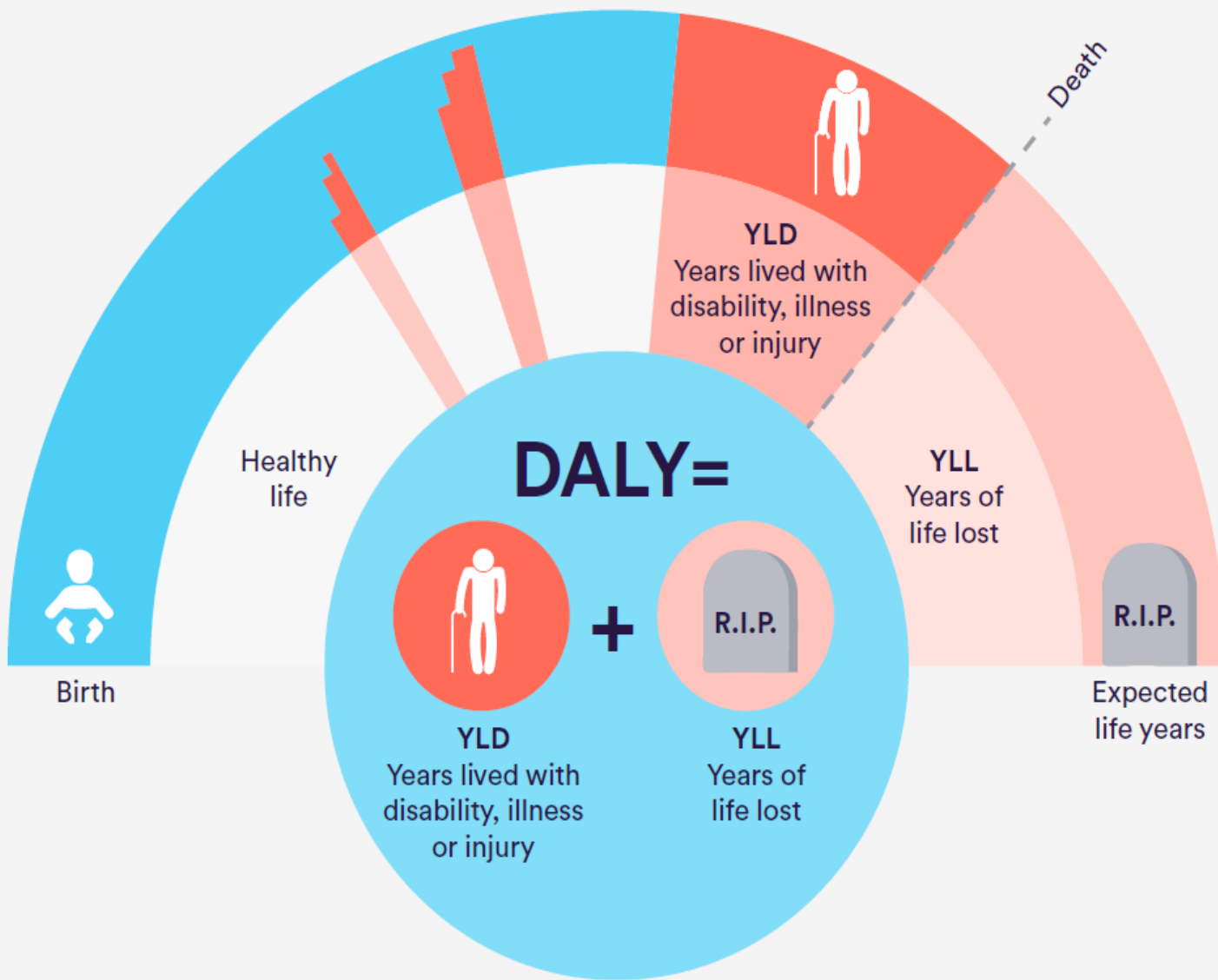
## DALY

Standardized quantitative measure of the BOD

$$\text{DALY} = \text{MORTALITY} + \text{MORBIDITY}$$

(Years of life lost due to premature death)

(The measure of all non fatal disease effects such as illness episodes Or chronic disability)



It can be used of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.



Source : Wiki Commons

# Example

A **DIABETIC** person dies at the **age of 60 years** with a **life expectancy of 75 years**. He had, due to diabetes complications, lived with **50% disability** for the **last 10 years** of his life.

Calculate DALY?

## Top 10 global causes of disability-adjusted life years (DALYs) in 2019

1. Neonatal conditions
2. Ischaemic heart disease
3. Stroke
4. Lower respiratory infections
5. Diarrhoeal diseases
6. Road injury
7. Chronic obstructive pulmonary disease
8. Diabetes mellitus
9. Tuberculosis
10. Congenital anomalies

**Life expectancy**

**73.4 years**

was the average life expectancy at birth globally in 2019



# Top 10 causes of DALY in Jordan for both sexes aged all ages (2019)

[Hide filters](#) | [Top-10 deaths](#) | [Top-10 DALYs](#) | [Underlying data](#) | [Download with OData API](#)

## Filters

### Country

Jordan

### Year

2019

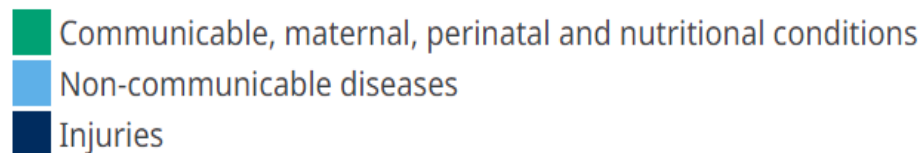
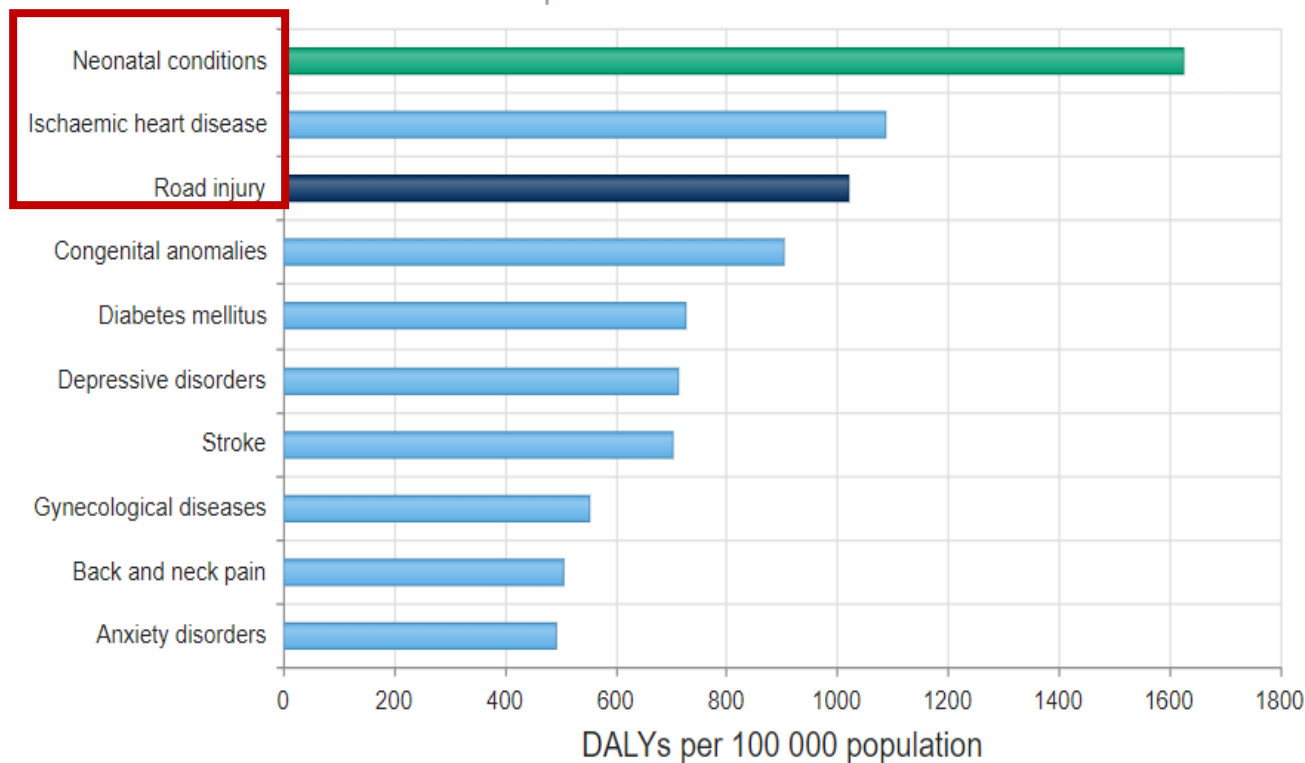
### Sex

Both sexes

### Age group

All ages

Top 10 causes of DALY

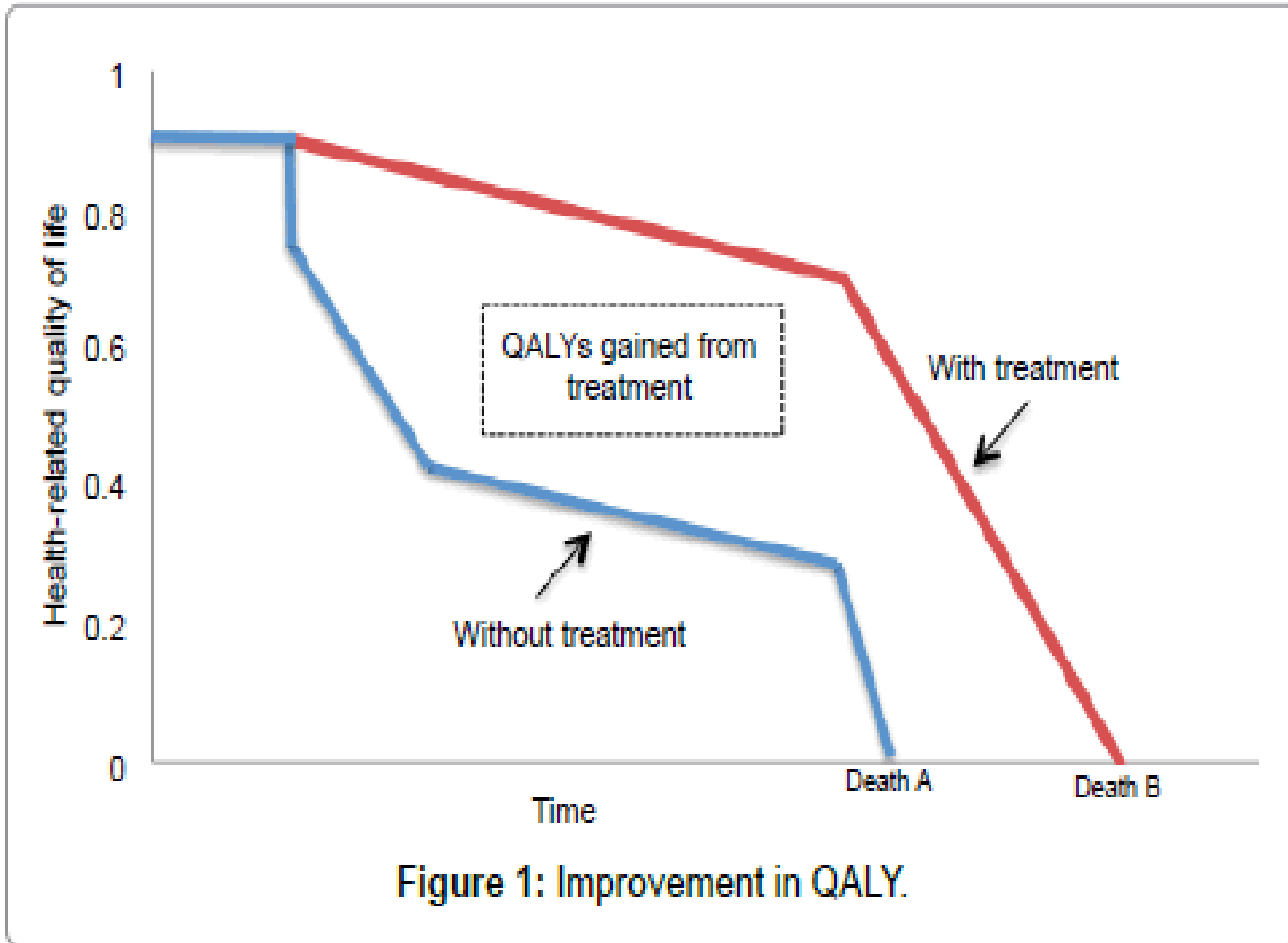


# QALY (Quality Adjusted Life Years)

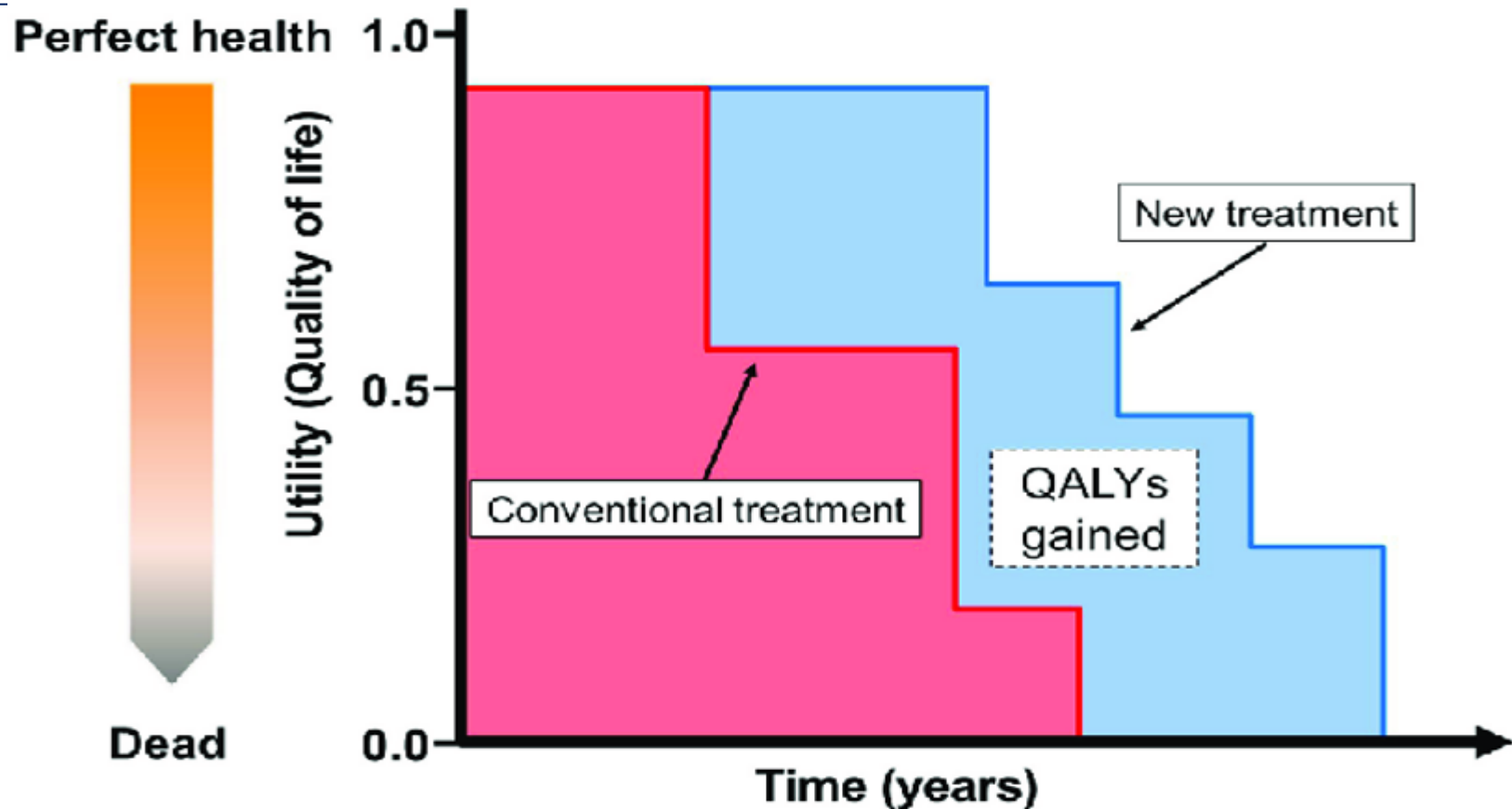
- A **quality-adjusted life-year (QALY)** takes into account both the quantity and quality of life generated by healthcare interventions.
- It is the arithmetic product of life expectancy and a measure of the quality of the remaining life-years.

A year of perfect health is worth 1 and a year of less than perfect health is worth less than 1. Death is considered to be equivalent to 0.

**QALYs** provide a common measure to assess the extent of the benefits gained from a variety of interventions in terms of health related quality of life and survival for the patient, and if these interventions generate a year of perfect health (one QALY).



**Comparisons** can be made between interventions, and priorities can be established based on those interventions that are relatively inexpensive (low cost per QALY) and those that are relatively expensive (high cost per QALY).



**Standard gamble method**: respondents choose between **remaining in ill health** for a specific period of time or medical **intervention** that could restore them to **perfect health or kill them**.

