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## Average Life Expectancy

This term is often misunderstood. It is commonly used to refer to the number of years than the average person will live of from birth. This number has increased significantly over the past century from 45 years to 76 years in developed countries. The increase is mainly due to reductions in infant mortality, deaths due to childbirth, and reduction in infectious diseases rather than extension of the adult life span.

## Maximum Life Span

The maximum life span is basically the record survival length for a species. For humans it is currently believed to be about 120. Interestingly enough Jeanne Calment is 121 years old.

## Synergy

The term synergy (also synergistic) refers to the effect of two substances used together being significantly greater than the effects of each substance added together. For example, substance A reduces heart disease by 15% and substance B reduces heart disease by 10%. However, when someone takes both substance A and B the reduction in heart disease is 45%.

## The Gompterz Law

The Gompterz Law refers to a phenomenon observed years ago by an actuary named Benjamin Gompterz. He observed that death rates for human populations doubled every decade between the ages of 20 and 80. However it has recently been observed that this phenomenon does not apply to the oldest old (those older than 85). As a group, those who have advanced to extreme old age are healthier than the population two decades younger (age 65).

## The Hayflick limit

The Hayflick limit refers to a phenomenon that occurs when human cells are grown in tissue culture. Under these conditions it is observed that the population can only double a limited number of times (around 50) before the cells senesce and are unable to grow any more. It is named after noted biogerontologist Leonard Hayflick.

## Telomerase

Telomerase is an enzyme that is normally active only in stem cells as well as the cells that give rise to sperm and egg. However when cells become cancerous, telomerase is activated. These cells can then replicate without a limit and this process is called "immortalization" There is currently debate about the actual role that telomerase activation plays in tumour formation.

## The Telomere

The telomere is the end of linear chromosomes which are found in all organisms except bacteria and Archae. The replication of the end of the chromosome is a problem due to the way DNA is replicated. Therefore there is a progressive loss of the end of chromosomes with each cell division. It has been proposed that this loss may play a role in the aging process. In germ cells, however, an [enzyme](#_gjdgxs) is activated that is able to preserve the ends of chromosomes in sperm and egg cells.