1. Name of the indicator			
Life expectancy at birth			
Last updated:	04/07/2023	**Version:**	1.1

2. Area	
Main area	State of health
Sub-area	

3. Definition

Life expectancy at a given age is the average number of years of life remaining if a group of people at that age experienced the mortality rated of a particular year in the course of their remaining life. Life expectancy at birth measures death rates for all age-specific causes in a given area and period.

4. Calculation formula

The figures are calculated using the (abbreviated) life tables that present the specific mortality rates by age. Abbreviated life tables are constructed based on the following columns:

- *Column 1*: the age groups are represented by intervals [x, x+n) of the table, with x varying from 0 to 85 years.
- *Column 2*: width of age band n.
- *Column 3*, P_x=number of people (population in the middle of the year) in age interval x.
- *Column 4*, D_x=number of deaths occurring in interval x.
- *Column 5*, specific standardised mortality rate in age interval x: ${}_nm_x = D_x/P_x$.
- *Column 6*, a_x: attributable fraction of the last life interval in age interval x. Assumed to be equal to 0.5 in all age groups.
- *Column 7*, conditional probability of dying between x and x+n, defined by ${}_nq_x = n \cdot {}_nm_x / (1+ n (1- a_x) {}_nm_x)$. Except for the last age group, which is always equal to 1.
- *Column 8*, number of survivors at age x, assuming a fictitious cohort of 100,000 births. Each row is calculated as the previous entry multiplied by the survival rate $1-{}_nq_x$, on ${}_nl_x = {}_n1_x\text{-}1(1-{}_nq_x\text{-}1)$
- *Column 9*, expected deaths (dx) in interval x, where $d_x = {}_n1_x \cdot {}_nq_x$
- *Column 10*, total number of years lived by surviving people aged x, between age x and x+n. Defined as ${}_nL_x = n ({}_nl_x - d_x) + a_x \cdot n \cdot d_x$
- *Column 11*, years lived (Tx) by the whole consort as from a particular age if the mortality rate remains constant. Obtained from the sum of all the members of the cohort in column 10 aged between x and 85 years and over. $T_x = \sum_{j>x} Lj$
- *Column 12*, Life span at age x, or the years of life contributed on average by each individual in the cohort, from age x. It is calculated as $e_x = T_x / {}_nl_x$

5. Reading

Amb el suport de:
Diputació de Girona
Generalitat de Catalunya
Unió Europea
Fons Europeu de Desenvolupament Regional

Life expectancy is one of the most widely used structural and development indicators. Incorporating the mortality experience of the entire population of all ages into a single figure allows for comparisons to be made on the incidence of mortality, and approximations to be made of the health conditions and level of development of a territory or population. Life expectancy in Europe in the last century has increased considerably, which has been generally attributed to medical and technological advances, reductions in infant mortality rates, changes in lifestyles, improvements in material and healthy living conditions and increased levels of literacy.
Life tables allow facts relating to mortality to be expressed in terms of probability, in such a way as it provides one of the most comprehensive and succinct vital indices available to estimate the duration of human life and the risks of death at each age.

6. Periodicity

The indicator is calculated based on groups of 4-year periods (starting in 2000) and is updated annually.

7. Source

National Statistics Institute (INE) and Idescat.

8. Constraints

Geographical ☐	Time ☐	Statistical confidentiality ☐

Description of the constraints

9. ODS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
☐	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

3.2

10. Comments and observations

The data are first presented in an indirectly standardised way based on the values at provincial level. Given that the province of Girona is organised by municipalities, between which there are considerable differences, and 84% of which have less than 5,000 inhabitants, a data smoothing process is carried out. This process, using a Bayesian approach based on INLA (Integrated Nested Laplace Approximation), allows the excess volatility of the data to be eliminated, and the most stable patterns to be achieved.