

Longevity Visualizer User's Guide

The Longevity Visualizer (LV) consists of six tabs that enable many types of queries. To help you understand the LV's functions, we have provided query examples for each tab, including user inputs and the LV's output. In each example, assume the current year is 2016.

<u>Survival</u>

The Survival tab allows queries on the probability of survival to all future ages for a person of a given birth year, sex, and current age. In addition, the chart shows the age-at-death probability distribution.

Example 1: What is the life expectancy at birth of a girl born this year? What is the chance that she will live at least to age 100?

User Input: Year born: 2016. Sex: Female. Age: 0. Select "Distribution of Death Ages" and "Expected age at death" (default selections). In the box that appears after the words "The probability of living beyond age," select 100.

LV Output: The life expectancy of 86 years and 11 months (or 86:11) appears as "Expected age at death" and is also plotted as a vertical line on the chart. The probability that she will live to age 100 (or older) is 11.9827%.





Survival (continued)

Example 2: I am a man who turns 62 this year. I am assessing the sufficiency of my savings for a retirement period of unknown length. To what age do I have only a 10% chance of surviving?

User Input: Year born: 1954. Sex: Male. Age: 62. Select "Distribution of Death Ages" and "Expected age at death" (default selections). In the box that appears amid the words "There is at least a ... % probability of living beyond age," select 10.

LV Output: There is at least a 10% probability of living beyond age 95:09.

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These estimates are based on the cohort life tables produced by the Office of the Chief Actuary at the Social Security Administration for the Intermediate Assumptions of the 2015 Trustees Report. The life tables are for birth year and sex, but not race, education, or any other factor. Note: the original life table age data were provided in years but have been interpolated here to monthly age values and are indicated with the notation [years : months].						
Click here for more information about the Longevity Visualizer.	Print Chart					
Survival Probability of Death Multi-Cohort Survival Gender Gap Joint Survivability Basic Functions						
Year bom: 1954 (****) Image: Distribution of Death Ages The probability of living beyond age 100 (***) Sex: Male (****) Image: B2 (*****) There is at least a 10 (******) There is at least a 10 (************************************	is 3.0252% nd age 95:09					
99th percentile survival age: 103:03 Percentiles	Export Data					
Shaded area under the Distribution of Death Ages curve represents 100% probability of death. —— Probability of Survival Distribution of Death Age						
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0 % 65 70 75 80 85 90 95 100 105 110 115	0.00 %					
Age Based on the Intermediate Assumptions of the 201.	5 Trustees Report.					



Probability of Death

This tab allows queries on the probability of dying at each exact future age for a person of a certain sex and birth year. It also displays the probability of dying within a given age range.

Example 3: I am a 75-year old woman. Assuming I survive to age 80, what would be my chances of dying between ages 85 and 97 (inclusive)?

User Input: Year born: 1941. Sex: Female. Current age: 80. Age range to compare, inclusive: 85 to 97.

LV Output: The probability of death within that age range is 66.49% (the program calculates by subtracting the probability of surviving to age 98 or beyond [11.47%] from the probability of surviving to age 85 or beyond [77.96%]).





Multi-Cohort Survival

This tab allows queries about changes in survival metrics across generations.

Example 4: What was the life expectancy for men at age 20 for those born in 1935 and what is it for those born in 2016? How much have the expectancies improved at the median, 95th, and 99.99th survival percentiles?

User Input: Cohorts: 1935 to 2016. Sex: Male. Age: 20. Select median (50th), 95th, and other (99.990000) survival-age percentiles; and expected age at death (that is, life expectancy).

LV Output: The chart shows the gradual upward trend in life expectancies across cohorts. The expected age at death for a 20-year-old man is about 75 if he was born in 1935, and improves to about 84 if he is born in 2016. The plots for the selected percentiles show similarly improved survival probabilities. Precise values for each cohort can be viewed by hovering the cursor at the appropriate location in the chart.

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These Trustee interpol	These estimates are based on the cohort life tables produced by the Office of the Chief Actuary at the Social Security Administration for the Intermediate Assumptions of the 2015 Trustees Report. The life tables are for birth year and sex, but not race, education, or any other factor. Note: the original life table age data were provided in years but have been interpolated here to monthly age values and are indicated with the notation [years : months].						
Click h	ere for more information about	the Longevity Visualizer	r				
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Survival	Probability of Death Multi-Coh	ort Survival Gender Gap	Joint Survivability Basic Functions				
Cohorts:	1935 🜩 to 2016 🜩	 Select percentiles to plot s 	survival ages O Select ages to plot survival probabilities				
i	Plot by Calendar Year	Madian (50th paraantila)					
Sex:	Male 🚖	95th percentile survival a	age V Survive to age: 20 V				
Age:	20 💌	99th percentile survival a	age ✓ Survive to age: 55 ♦				
		vother percentile: 99.99	90000 🖈 🗸 Survive to age: 75 文				
		other percentile: 99.99	99900 🐳 Survive to age: 90 🐳				
		Include expected age at	Survive to age: 120 Export Data				
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	1940	1950 1960) 1970 1980 1990 2000 2010 Birth Year				
	Based on the Intermediate Assumptions of the 2015 Trustees Report.						



Gender Gap

This tab is similar to **Multi-Cohort Survival** but shows the gap between males and females for the various survival metrics over the generations.

Example 5: What is the difference (or gap) between men and women in the probability of current 62year-olds surviving to age 80, and how has it changed across birth cohorts from 1935 to 2016?

User Input: Cohorts: 1935 to 2016. Age: 62. Probability of surviving to age: 80. Select "Males," "Females," and "Gender gap" boxes.

LV Output: The chart shows the probability of surviving to age 80 for 62 year-old men and women in percent, and the percentage-point gap between the two probabilities, for each birth year. The gap has been closing over time, from more than 11 percentage points for those born in 1935 to 5 percentage points for those born in 2016.

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Click h	e for more information about the Longevity Visualizer.					
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Survival	Probability of Death Multi-Cohort Survival Gender Gap Joint Survivability Basic Functions					
Cohorts: Age:	1935 m to 2016 m Plot by Calendar Year Select function to plot 62 m Probability of surviving to age: B0 m Expected age at death Age at death for survival percentile: 95.000000 m 95.000000 m	 ✓ Males ✓ Females ✓ Gender gap Export Date 	ata			
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		- Males: Survival probability to 80 is 78.63%	(s)			
20		Females: Survival probability to 80 is 83.63%				
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	1940 1950 1960 1970 1980 1990 Birth Year	2000 2010				
		Based on the Intermediate Assumptions of the 2015 Trustees Re	eport.			



Joint Survivability

This tab allows queries on the dual survival probabilities of any two persons.

Example 6: For a married couple (husband born in 1962 and wife born in 1970), what are the chances that both spouses will be alive when the wife reaches age 85, in 2055?

User Input: Start year: 2016. Person A: Birth Year = 1962, Sex = Male. Person B: Birth Year = 1970, Sex = Female. Select "Both are alive" probability.

LV Output: The chart shows an 11.2505% chance that both spouses will be alive in 2055, when the wife reaches age 85.

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These estimates are based on the cohort life tables produced by the Office of the Chief Actuary at the Social Security Administration for the Intermediate Assumptions of the 2015 Trustees Report. The life tables are for birth year and sex, but not race, education, or any other factor. Note: the original life table age data were provided in years but have been interpolated here to monthly age values and are indicated with the notation [years : months].							
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Click here for more information about the Trustees Report.	Print Chart						
Survival Probability of Death Multi-Cohort Survival Gender Gap Joint Survivability Basic Functions							
Select two different people to compare their joint probabilities of being alive over the time period starting with the selected calendar year and through the last year the younger person could be alive (his birth year + 120). This is ideal for making financial decisions that include a spouse, aging parents, dependent child, business partner, etc. The probability that both may be alive or that at least one may be alive in a future year can be seen.							
Show the probabilities that							
Start Year 2016 🚖 Birth Year Sex Age 🗹 Both are alive Chip Sea Age 🕼 Both are alive Chip Sea Age	either)						
Person A 1962 Male 54 Only A is alive At least one is alive (A or B or both) B is alive (A is either) B is dead (A is	either)						
Person B 1970 Female 46 Only B is alive Nether is alive	Export Data						
Joint Probabilities for a Male born in 1962 (A) and a Female born in 1970 (B). In 2016, A is age 54 and B is age 46.							
Both are alive							
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0 % 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080	2085 2090						
Year							
Based on the Intermediate Assumptions of the 2015 Trustees Report.							



Joint Survivability (continued)

Example 7: For the same married couple (husband born in 1962 and wife born in 1970), assume that both survive until 2032, when the husband reaches age 70. What are the chances that only one of them (regardless of whom) will be alive in the ensuing years?

User Input: Start year: 2032. Person A: Birth Year = 1962, Sex = Male. Person B: Birth Year = 1970, Sex = Female. Select "Both are alive" and "Only one is alive (either A or B but not both)" probabilities.

LV Output: The chart shows that the probability that both spouses are alive after 2032, when the husband turns 70, continues to exceed the probability that only one of them remains alive until 2048, after which the latter probability increases until it peaks at 58.1764% in 2054.





Basic Functions

This tab allows queries on the basic functions of the life table data over the lifetimes of specific cohorts. Such functions include the life expectancy values at each age or the probability of death for those at each current age.

Example 8: What are the probabilities of death within a year for a man born in 1960 and a woman born in 1925?

User Input: Select "Probability of death within a year given survival to each age." Birth (cohorts): Males, 1960; Females, 1925.

LV Output: The plots show strong similarities between the two cohorts for ages 1 through 99, but noticeable gaps in the mortality rates for infants and centenarians.

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Click h	here for more information about the Longevity Visualizer.					
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Survival	Probability of Death Multi-Cobort Survival Gender Gan Joint Survivability Basic Functions					
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© Sun	winich type of data to display on the graph for each conort selected at right vival Function: percent of original cohort population remaining at each age.		Chart	cohorts/ chart.	sexes to in	nclude on the
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🔘 Ехр	pected age at death at each age.		Export Data	1951	Males	Females A
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