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.

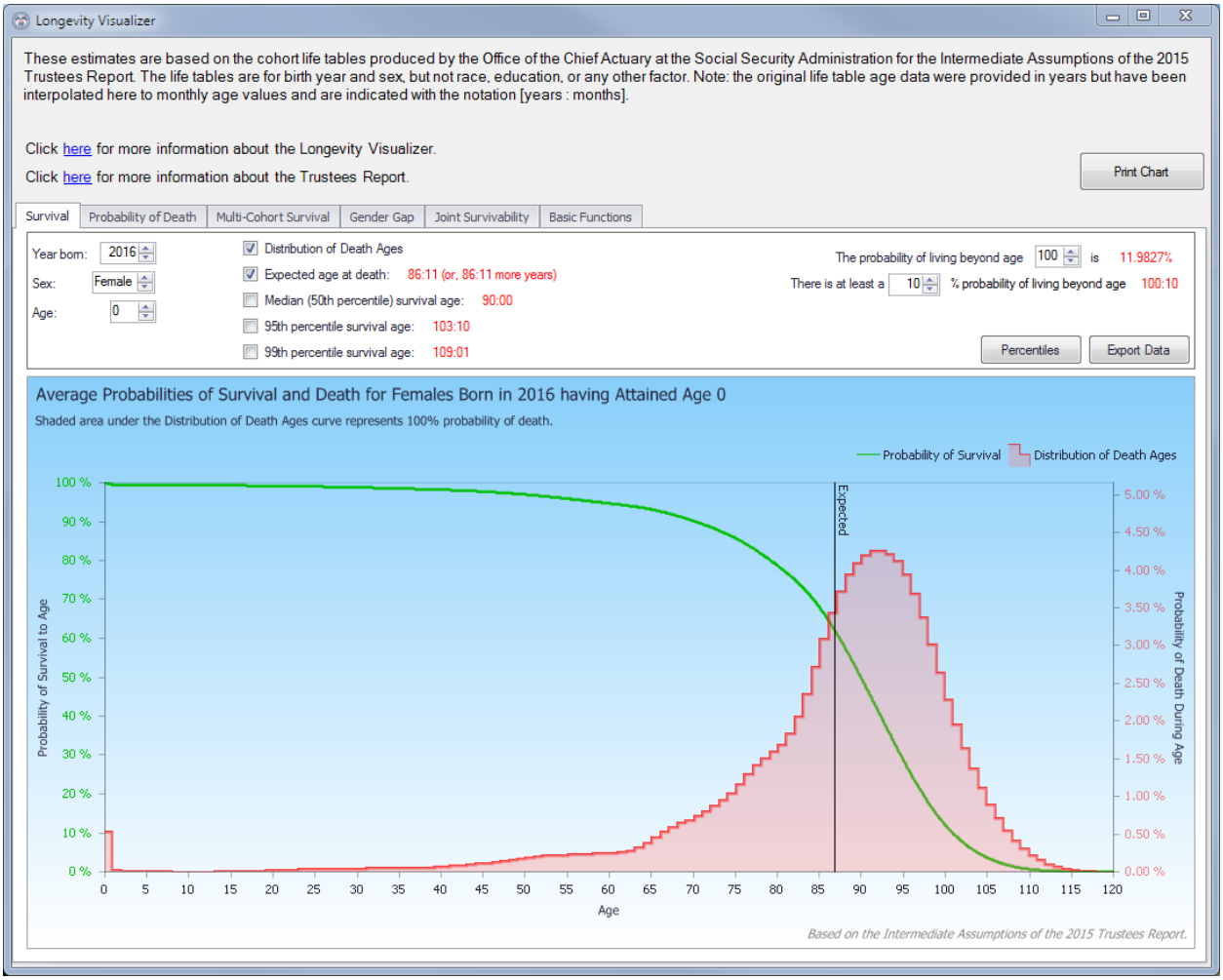
Survival

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%.

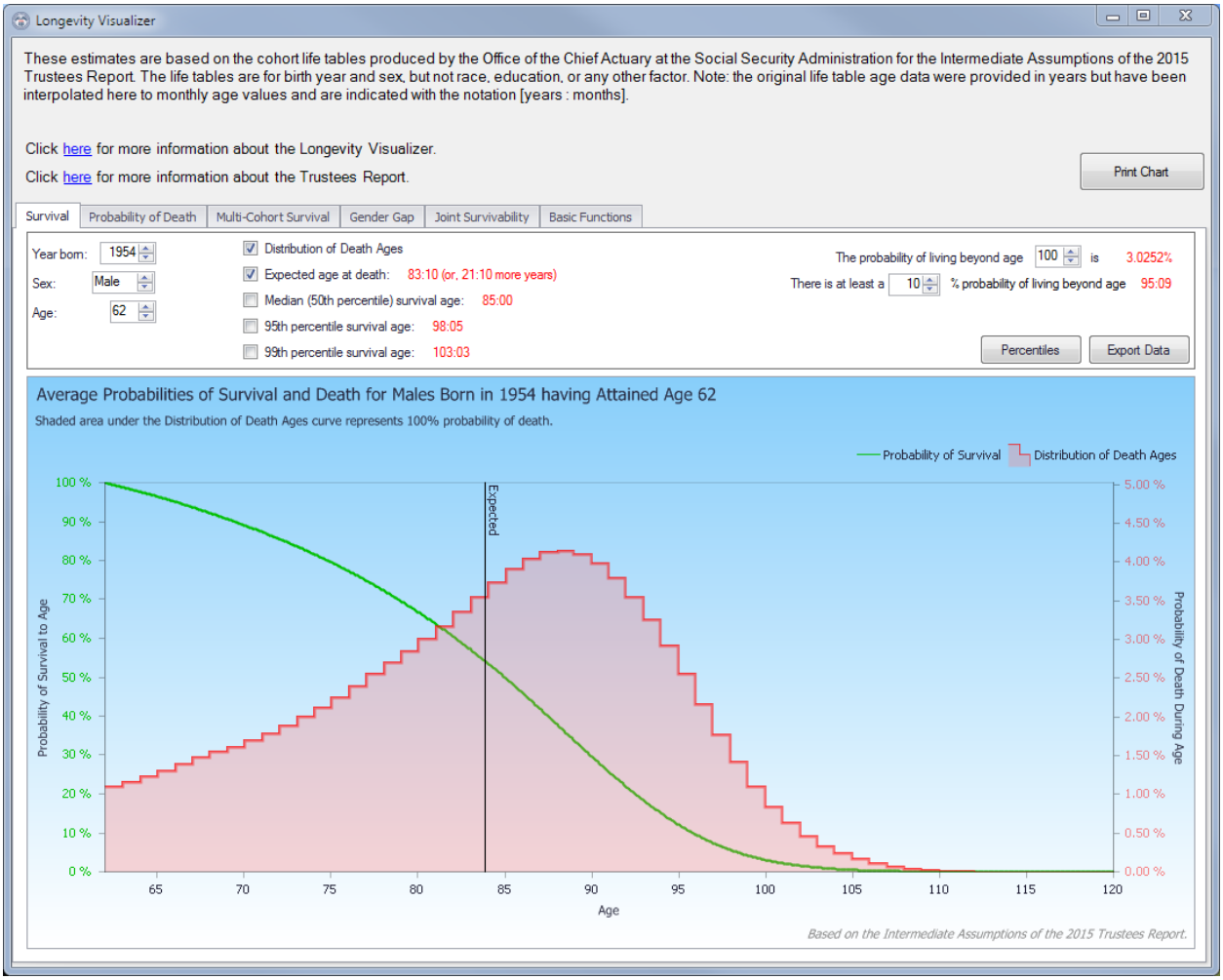


Survival *(continued)*

***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.



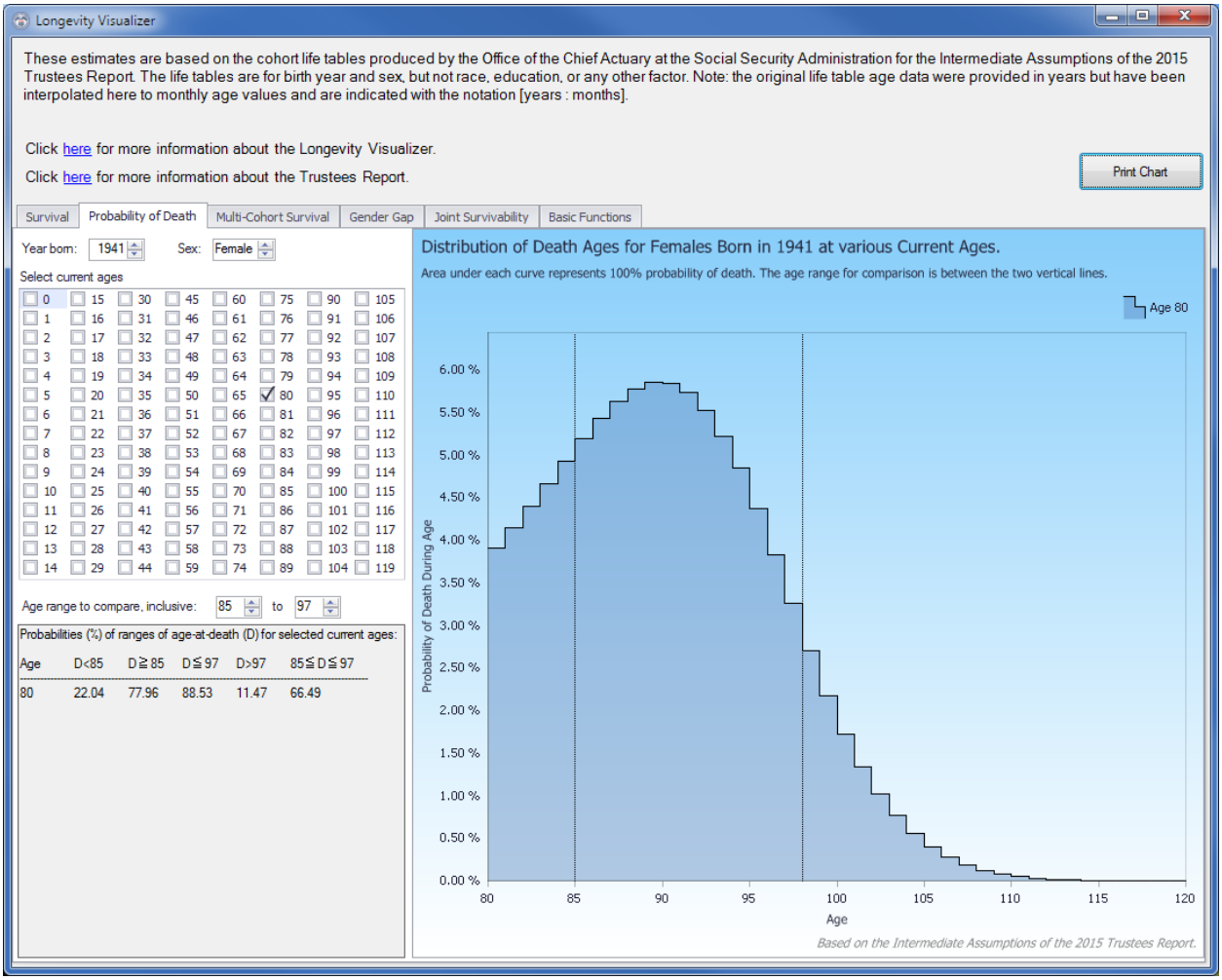
Probability of Death

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%]).



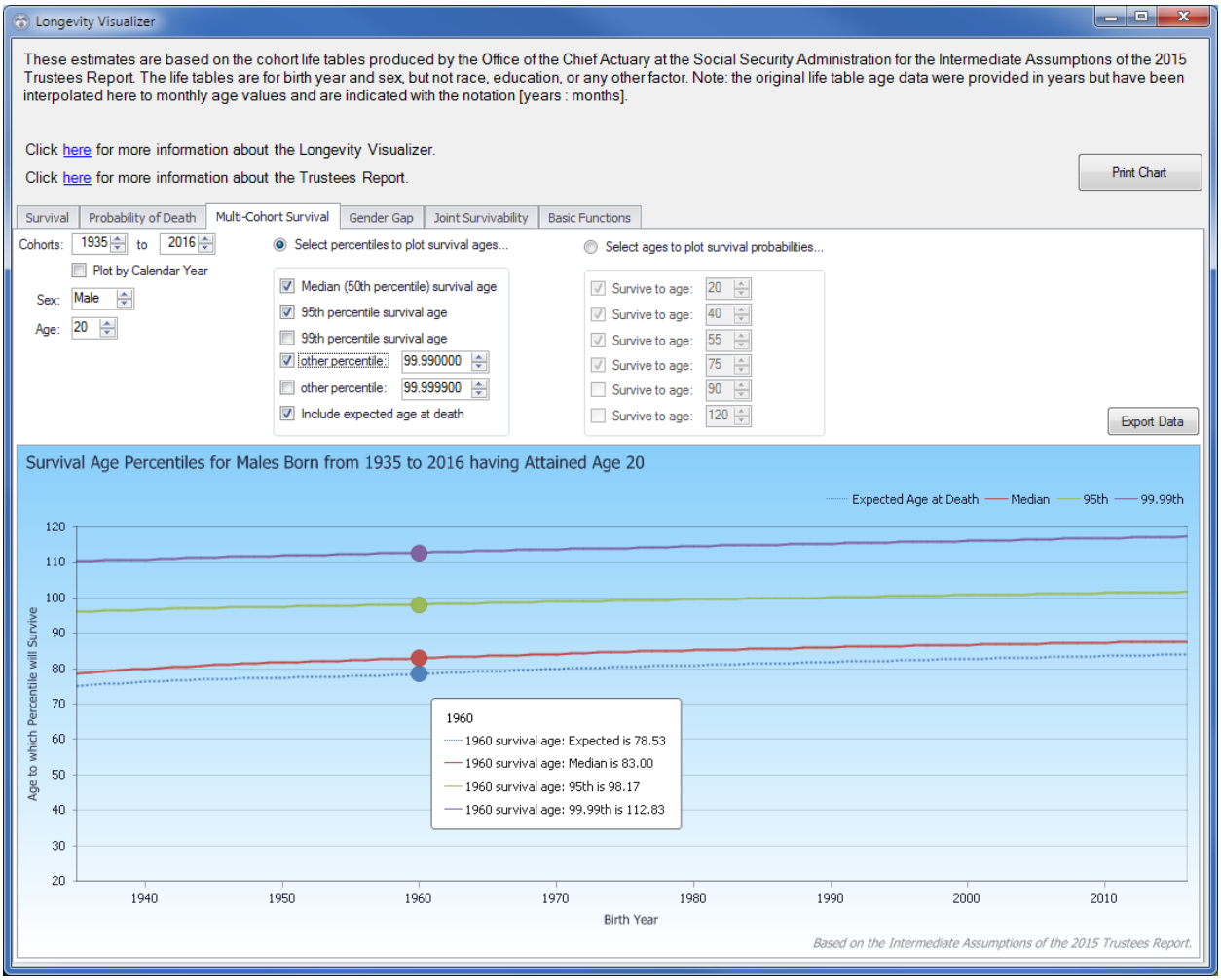
Multi-Cohort Survival

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.



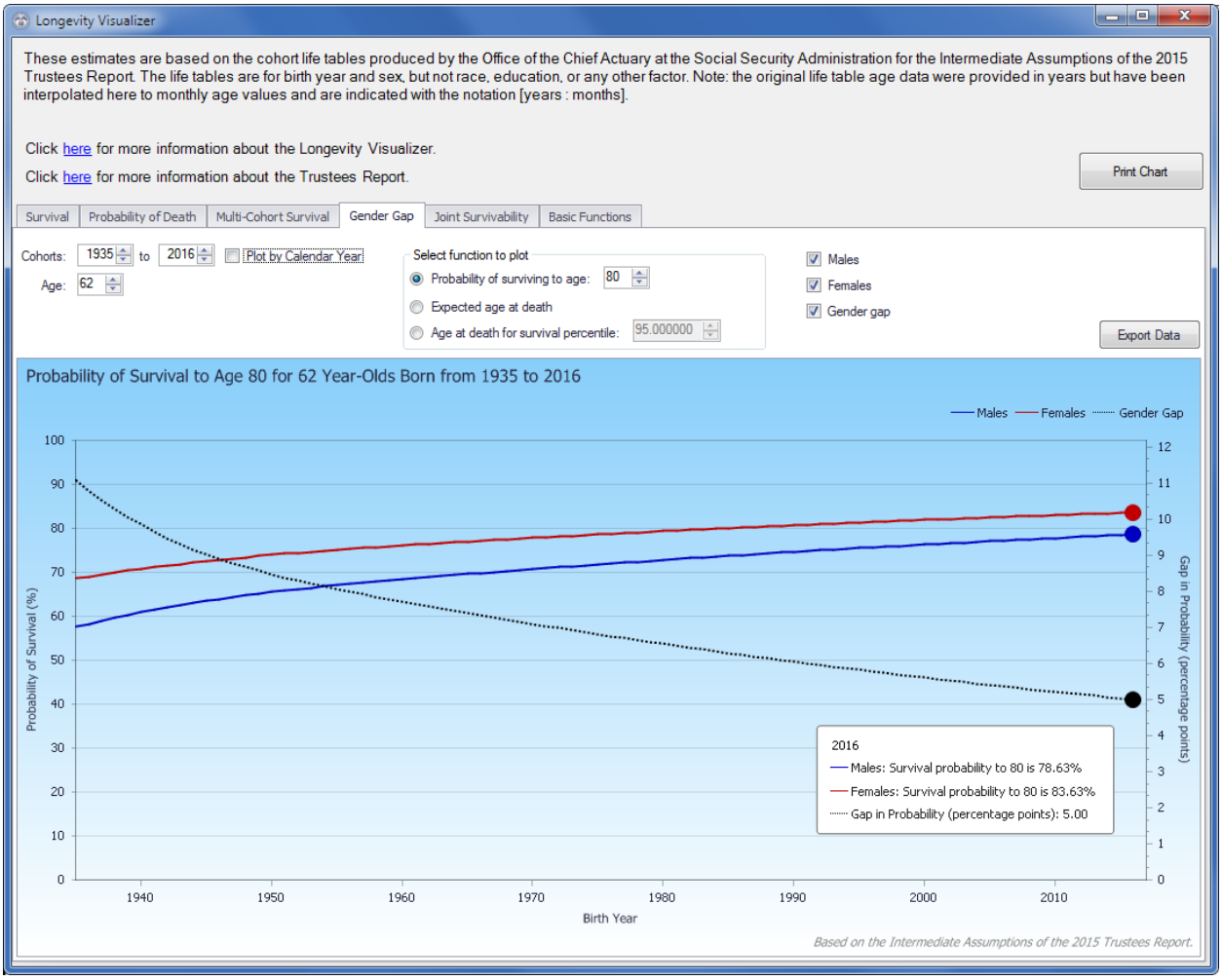
Gender Gap

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 62-year-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.



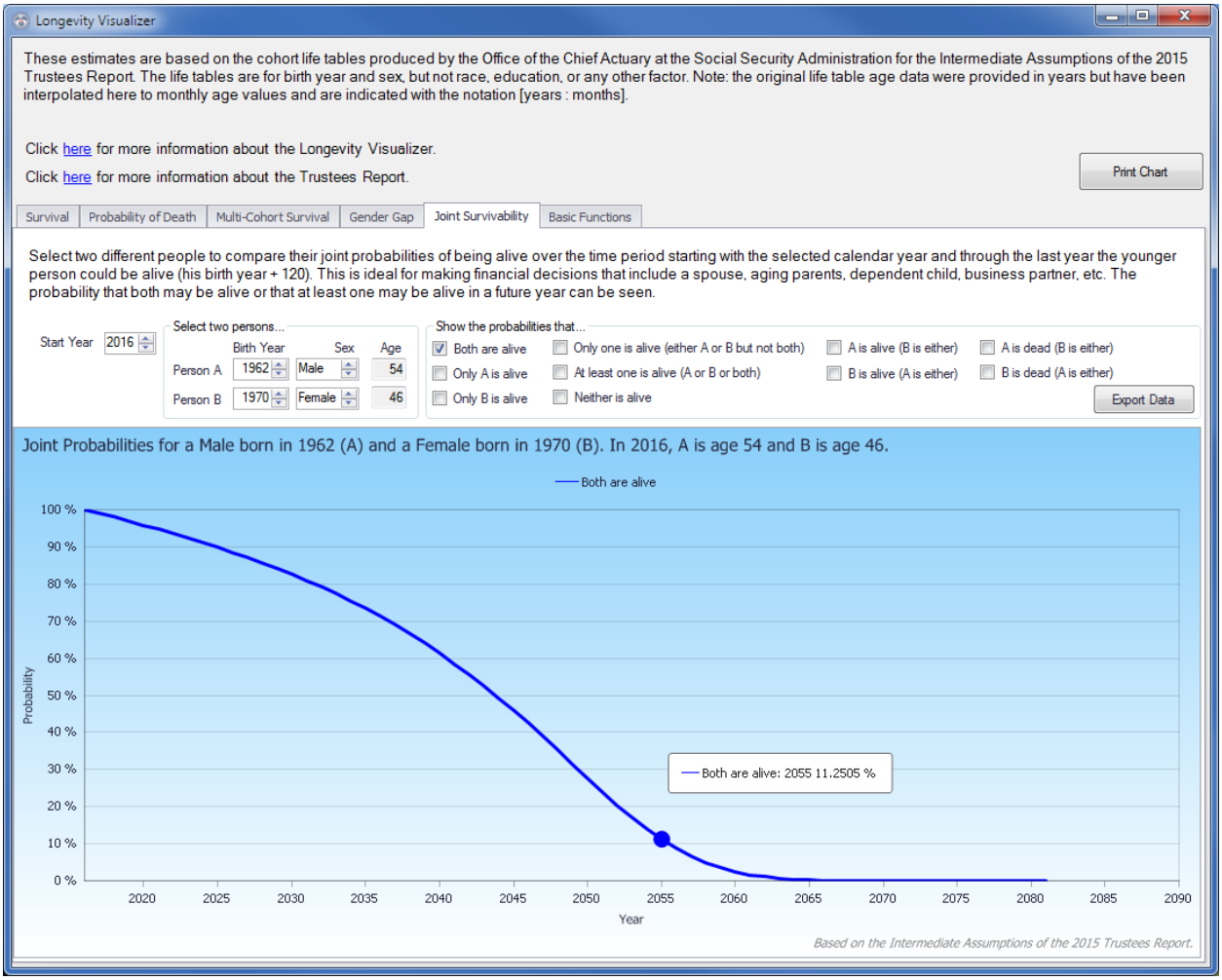
Joint Survivability

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.

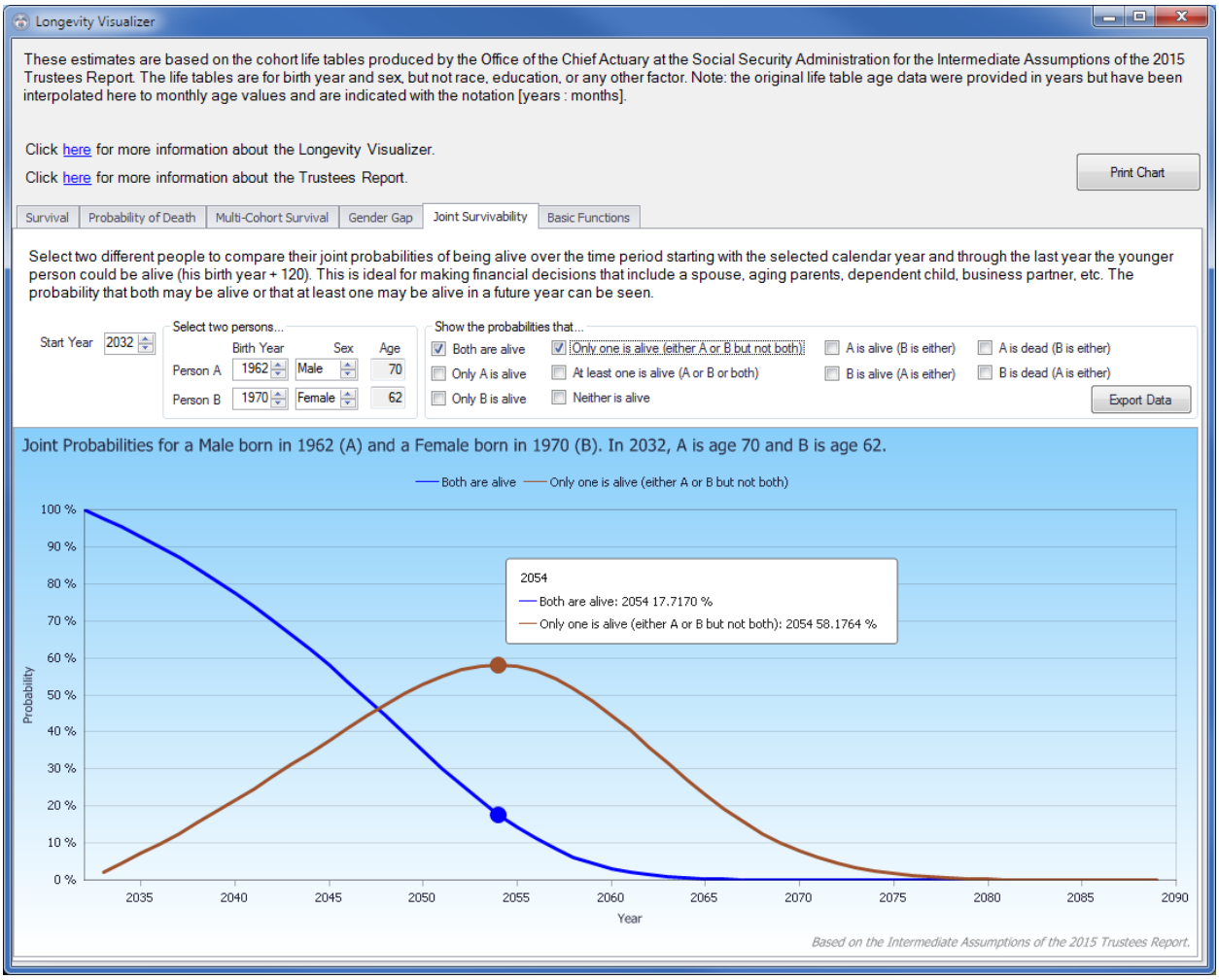


Joint Survivability *(continued)*

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.