

EBRI-ERF Policy Forum #77

**Longer life expectancy, longevity risk,
implications on retirement income and cost**

**A brief actuarial view
(with emphasis on “brief”)**

December 10, 2015

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Agenda

December 10, 2015

- Life expectancy
 - Definition
 - Ages at death 1900 to 2010 (Social Security Administration data)
- Longevity risk
 - Definition
- US Population : look back and forecast
- Cost implications (in brief)
 - Annuitants/Individuals
 - Plan Sponsors

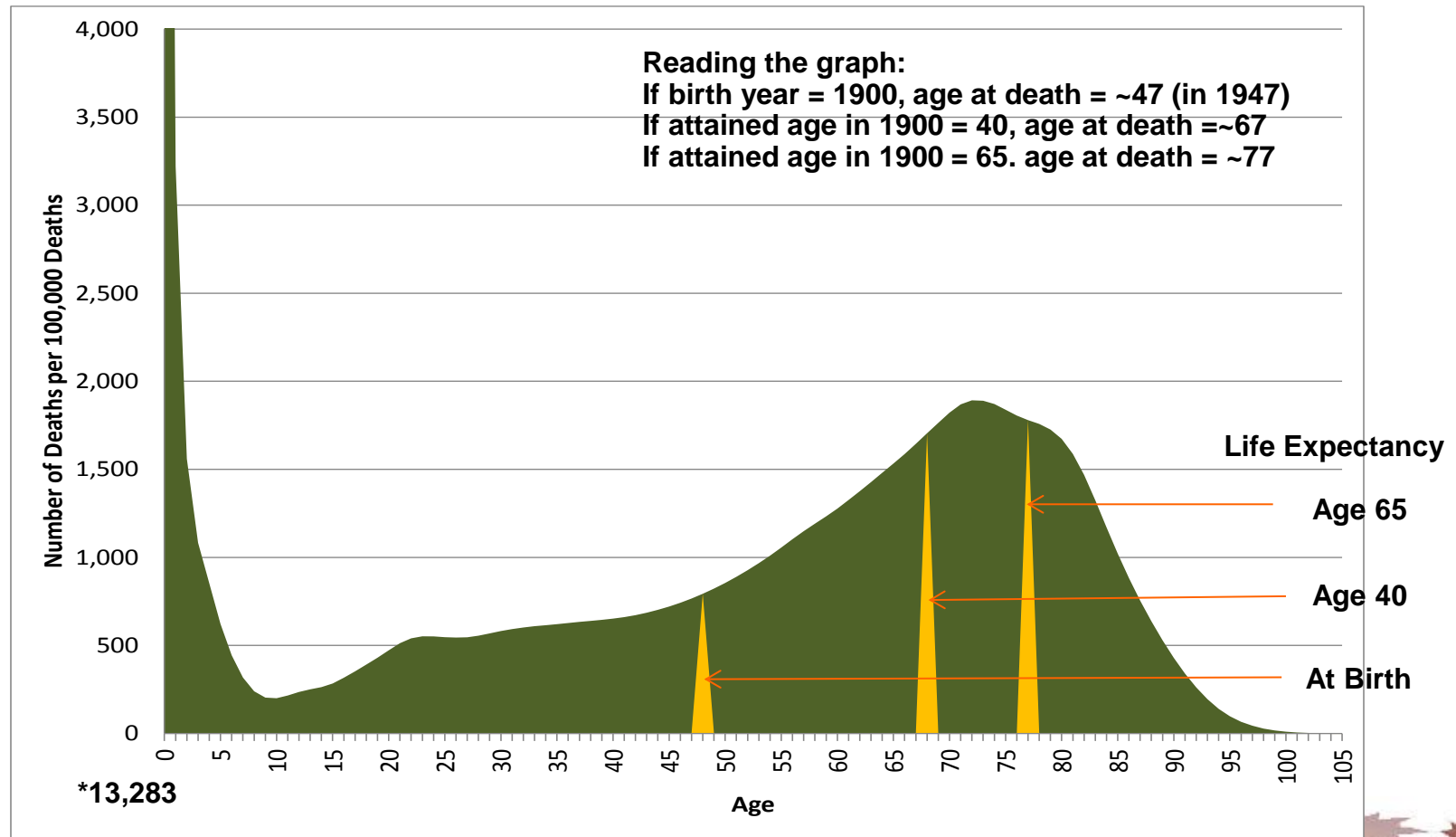


Life Expectancy

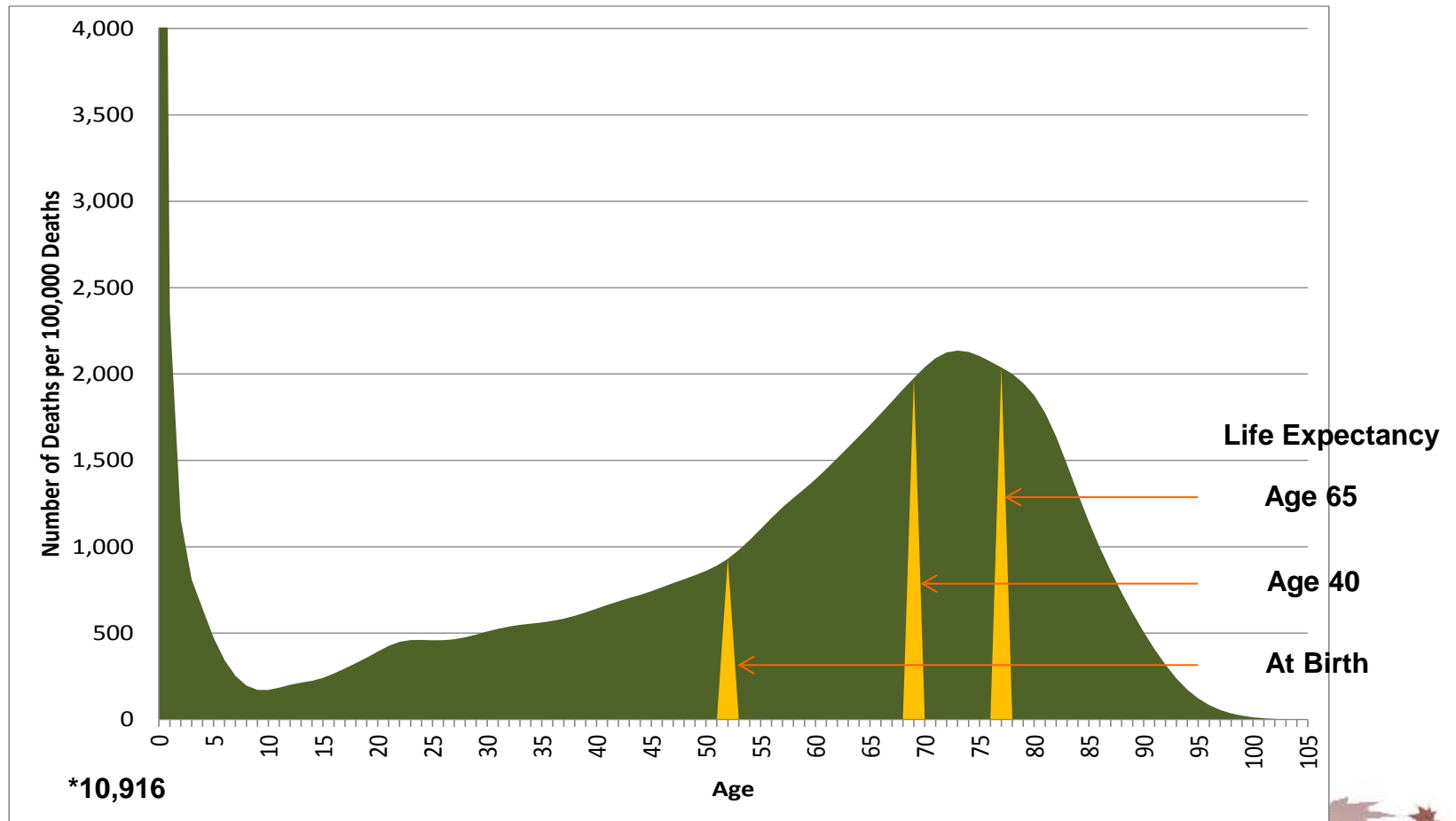
- Life expectancy
 - Is the expected number of years of life remaining at a given age
 - Varies by age, year of birth, gender, income and place of residence
- US life expectancy graphs (from Social Security Administration studies)



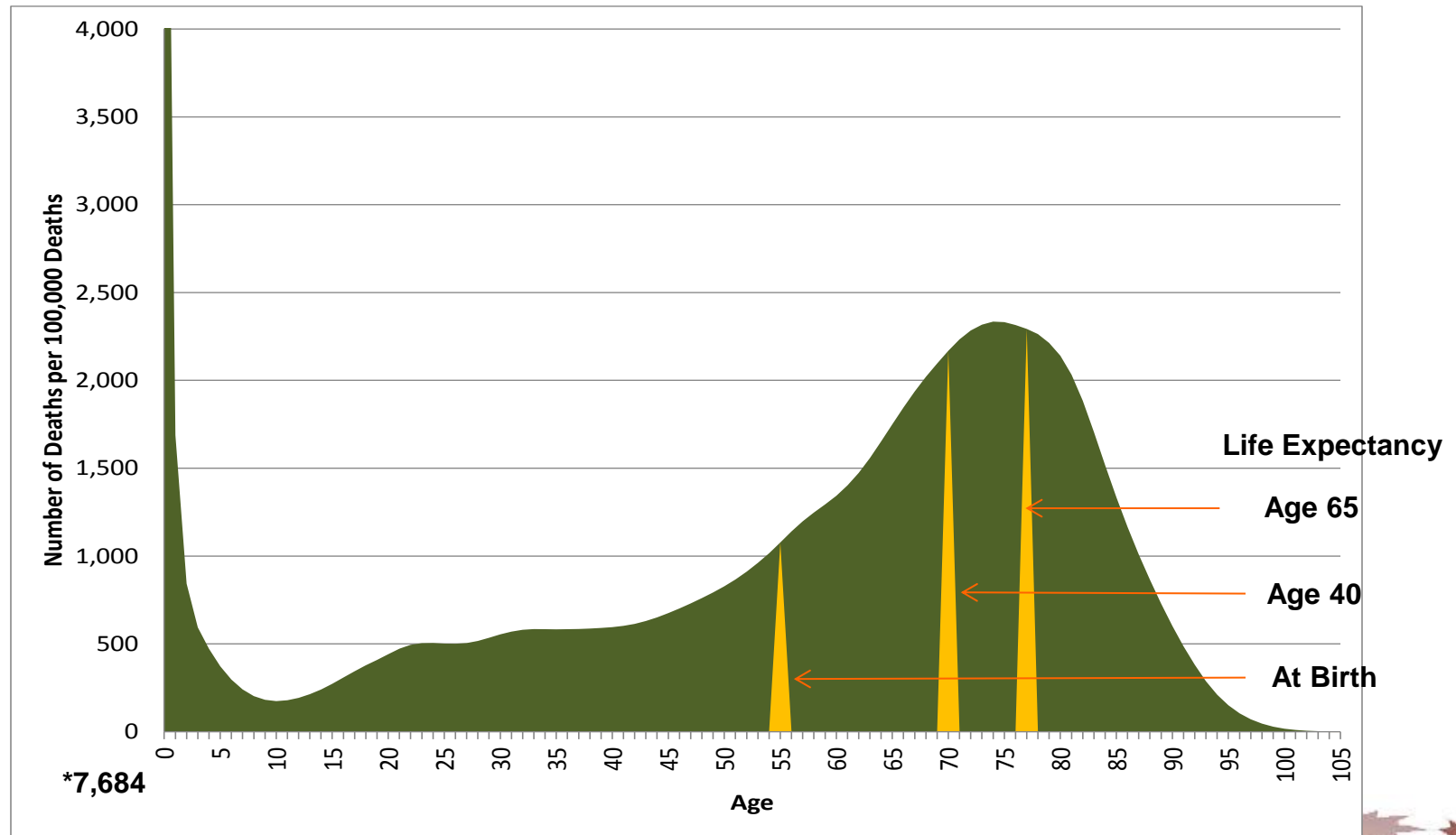
Life Expectancy – Age at Death in 1900



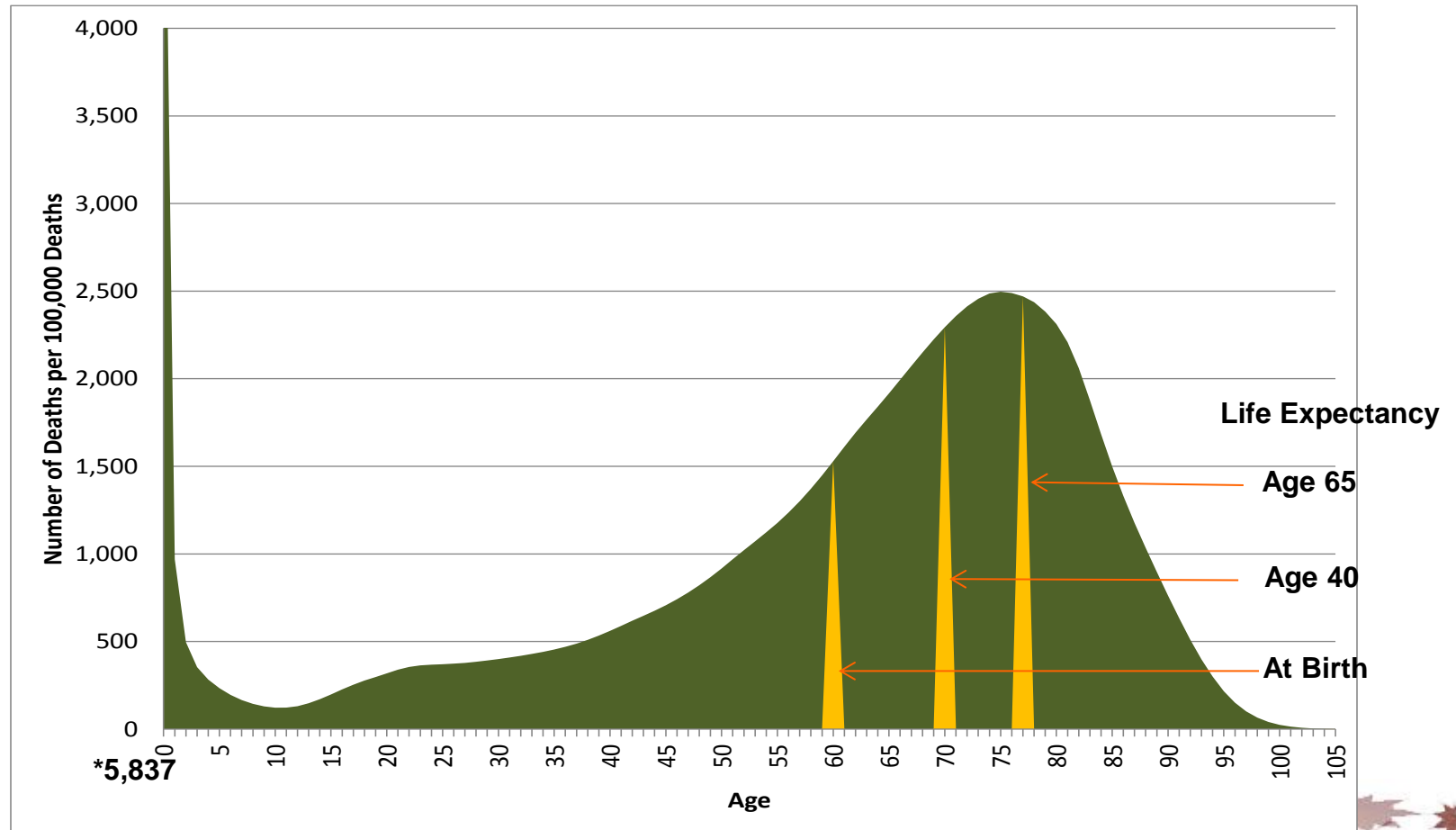
Life Expectancy – Age at Death in 1910



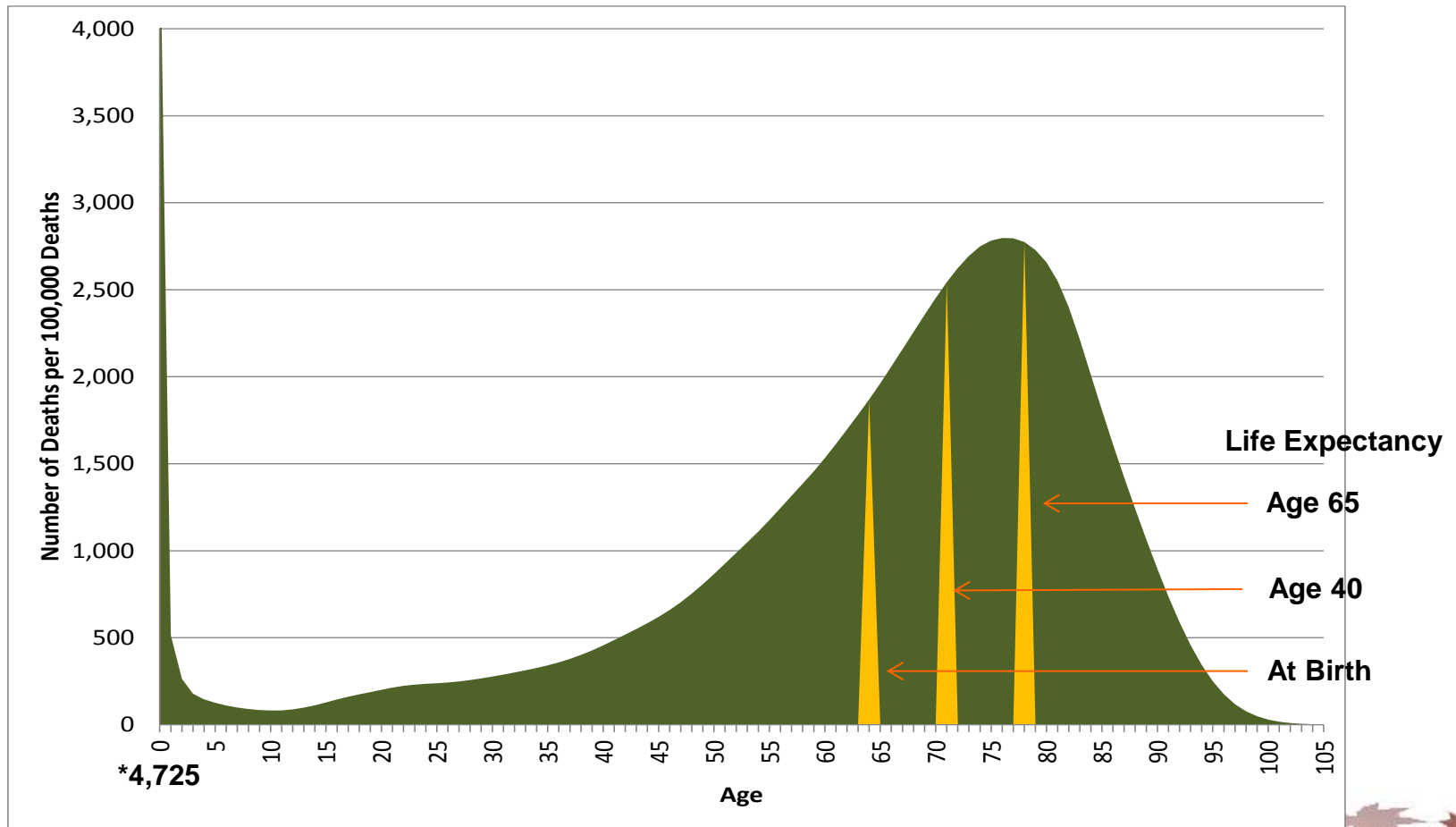
Life Expectancy – Age at Death in 1920



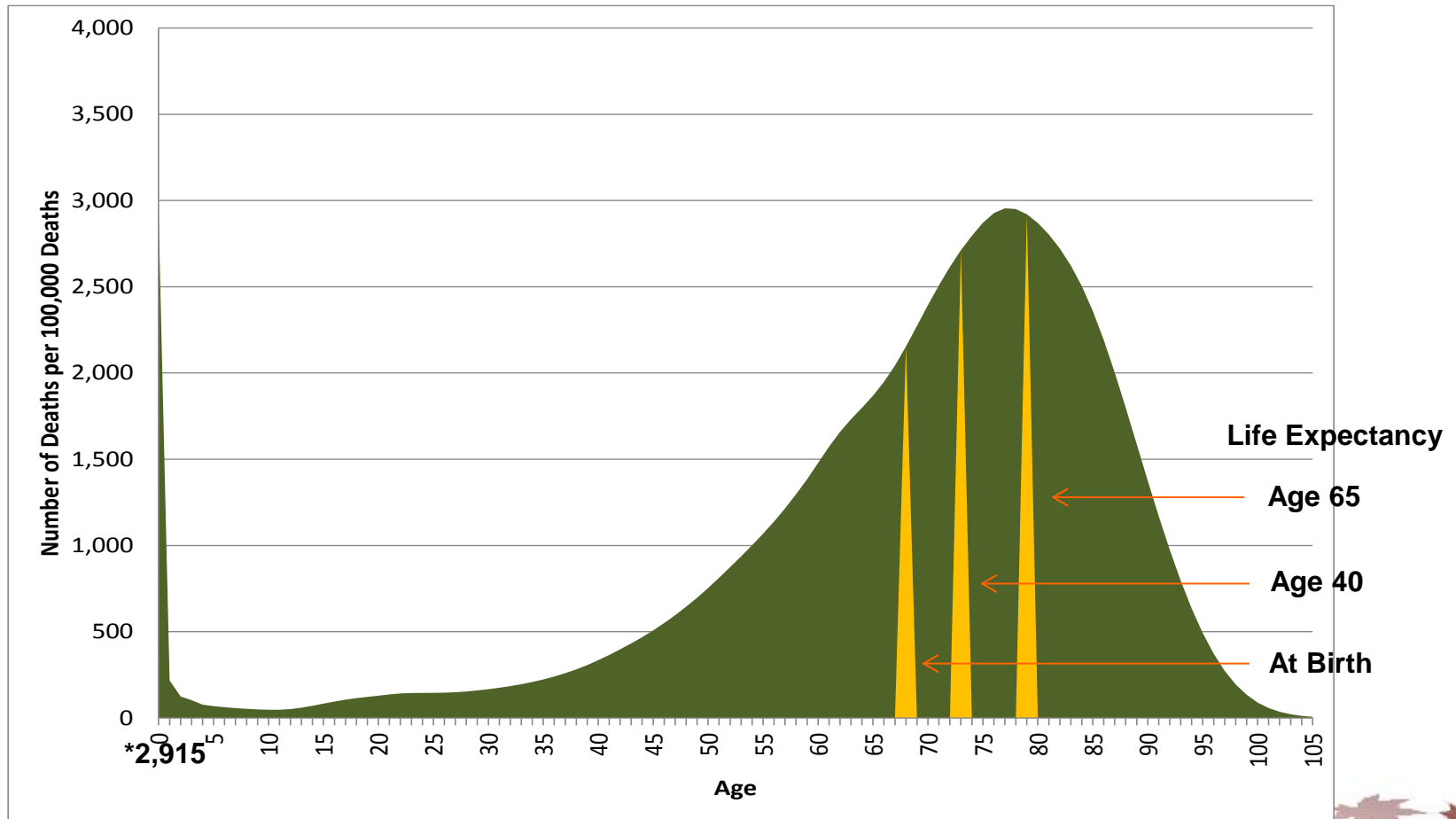
Life Expectancy – Age at Death in 1930



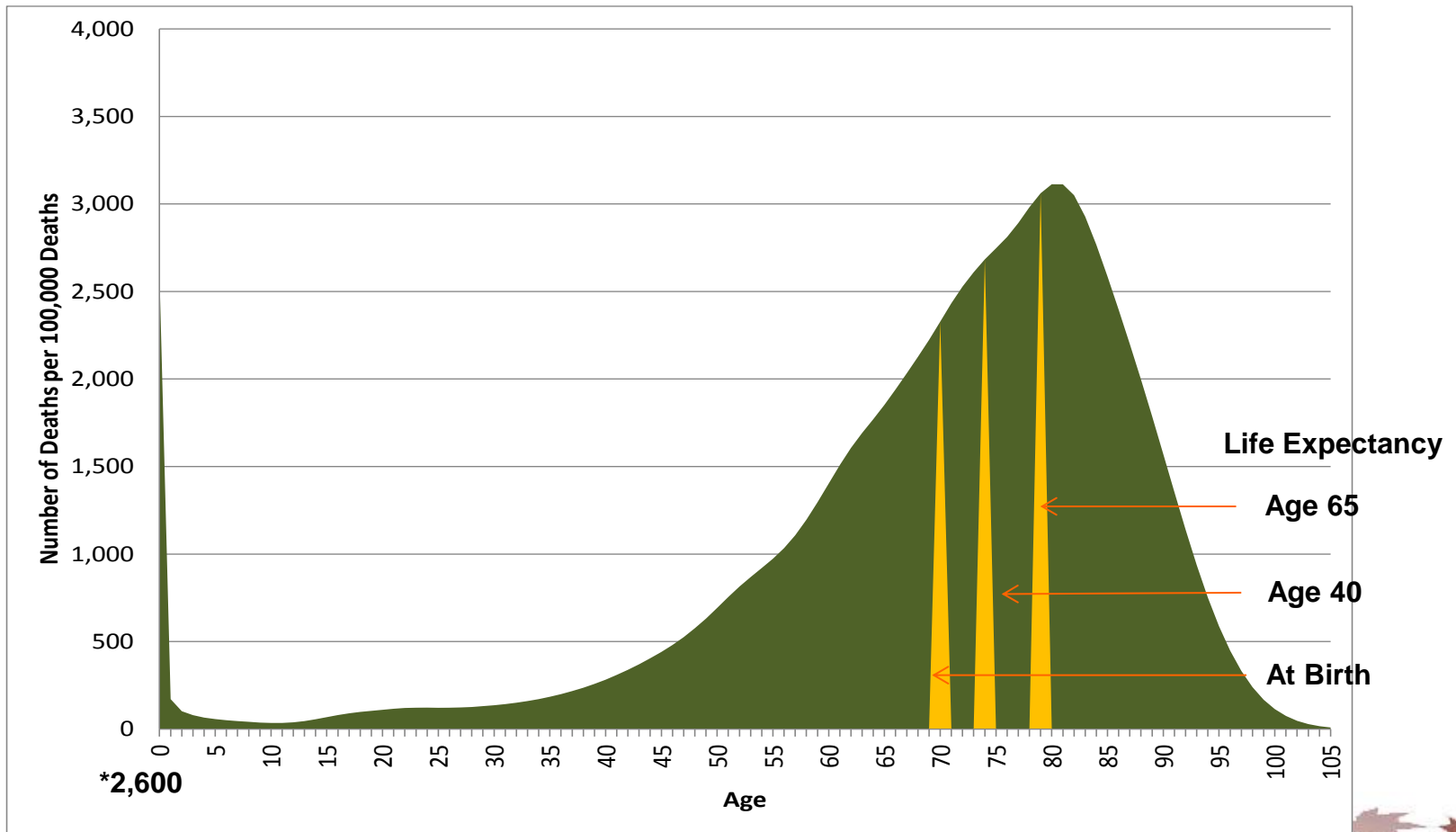
Life Expectancy – Age at Death in 1940



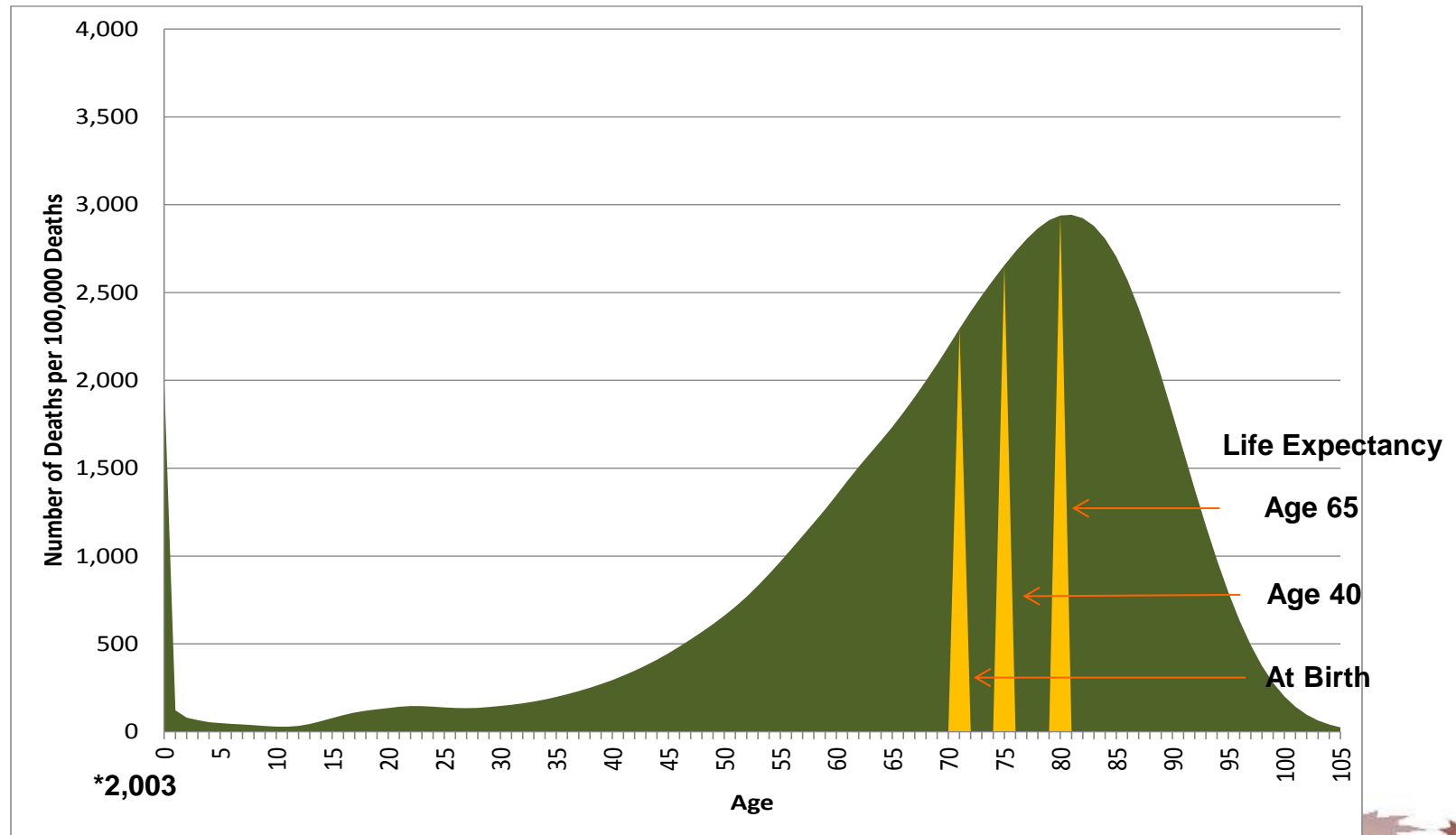
Life Expectancy – Age at Death in 1950



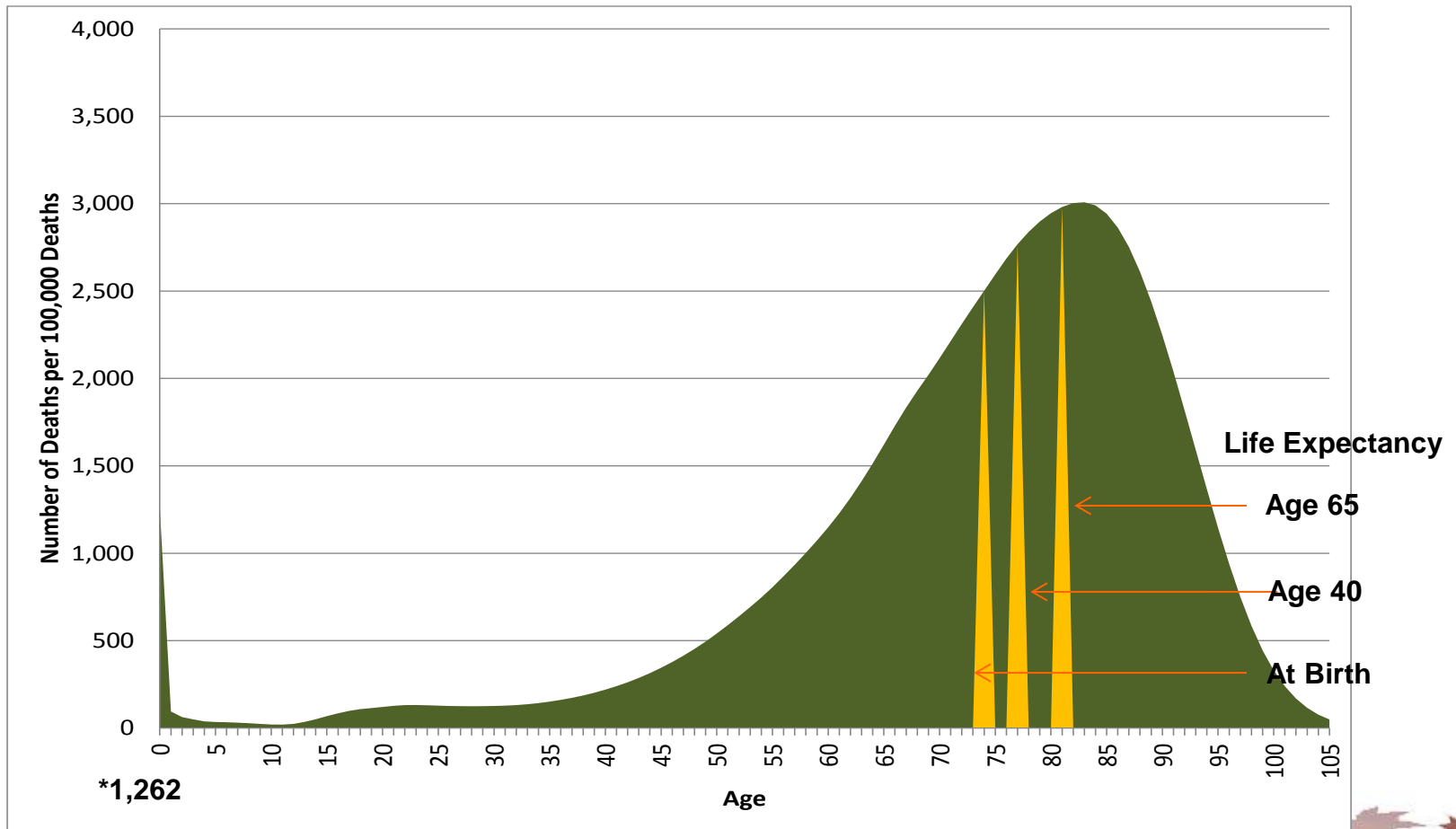
Life Expectancy – Age at Death in 1960



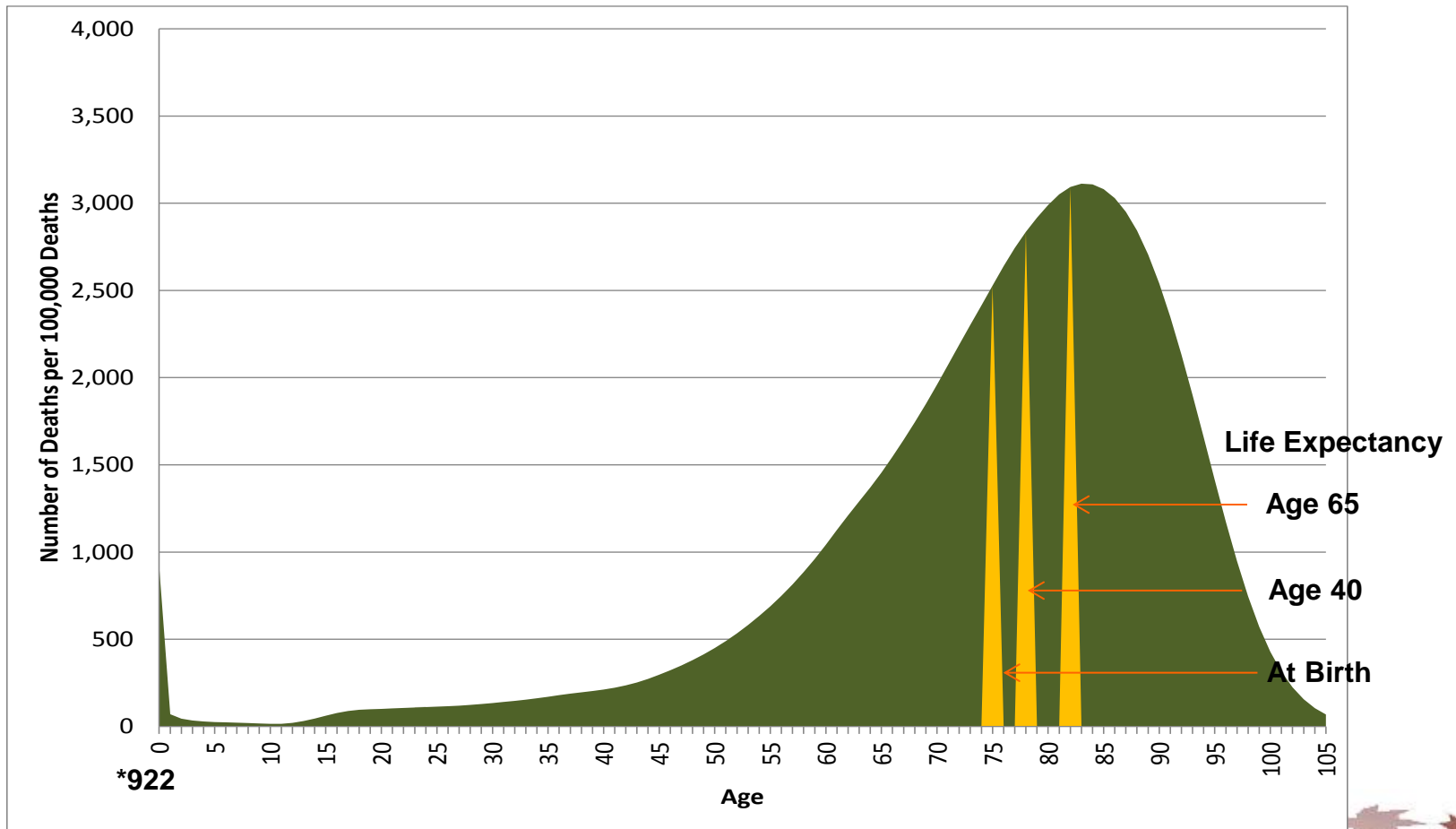
Life Expectancy – Age at Death in 1970



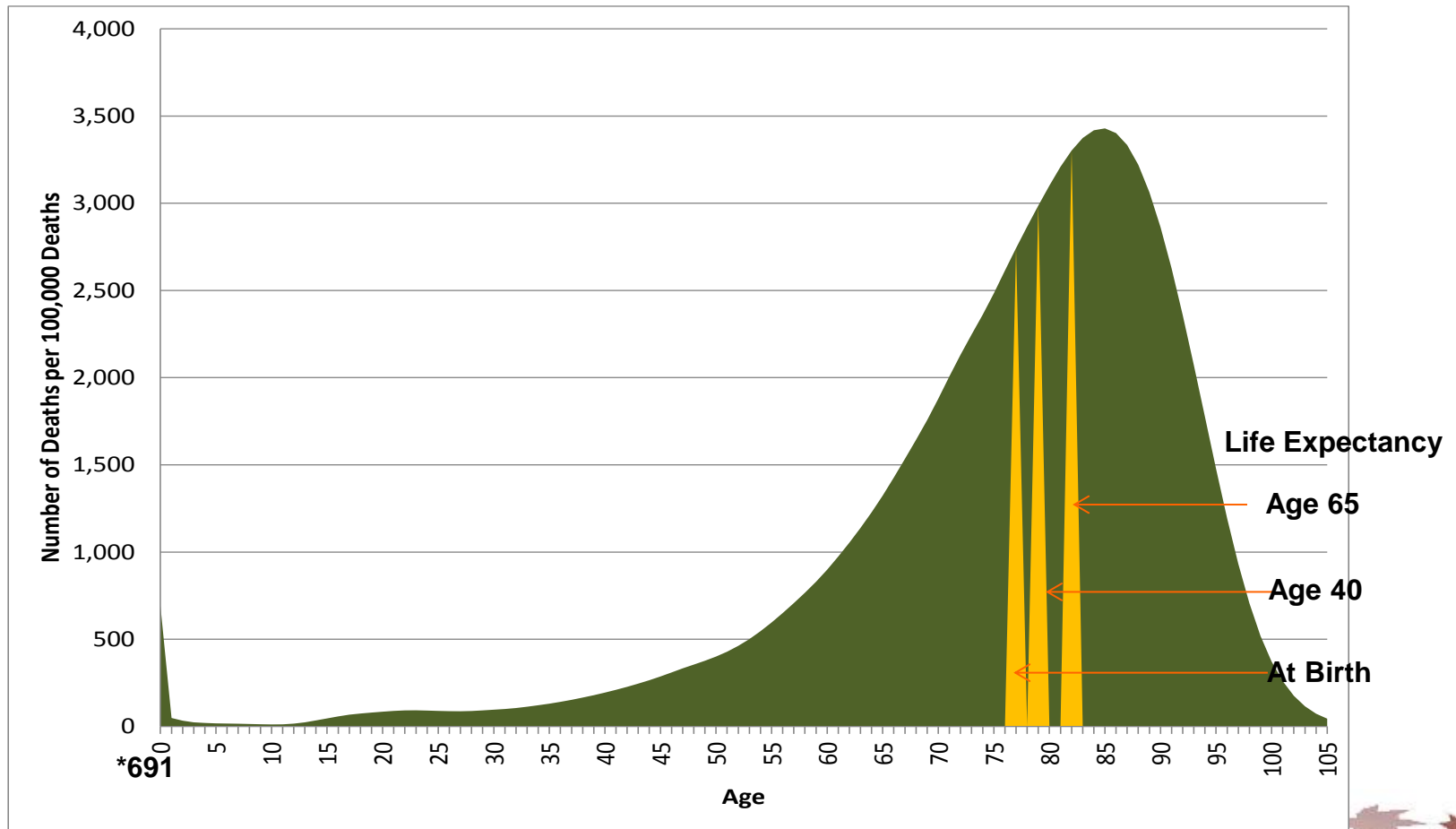
Life Expectancy – Age at Death in 1980



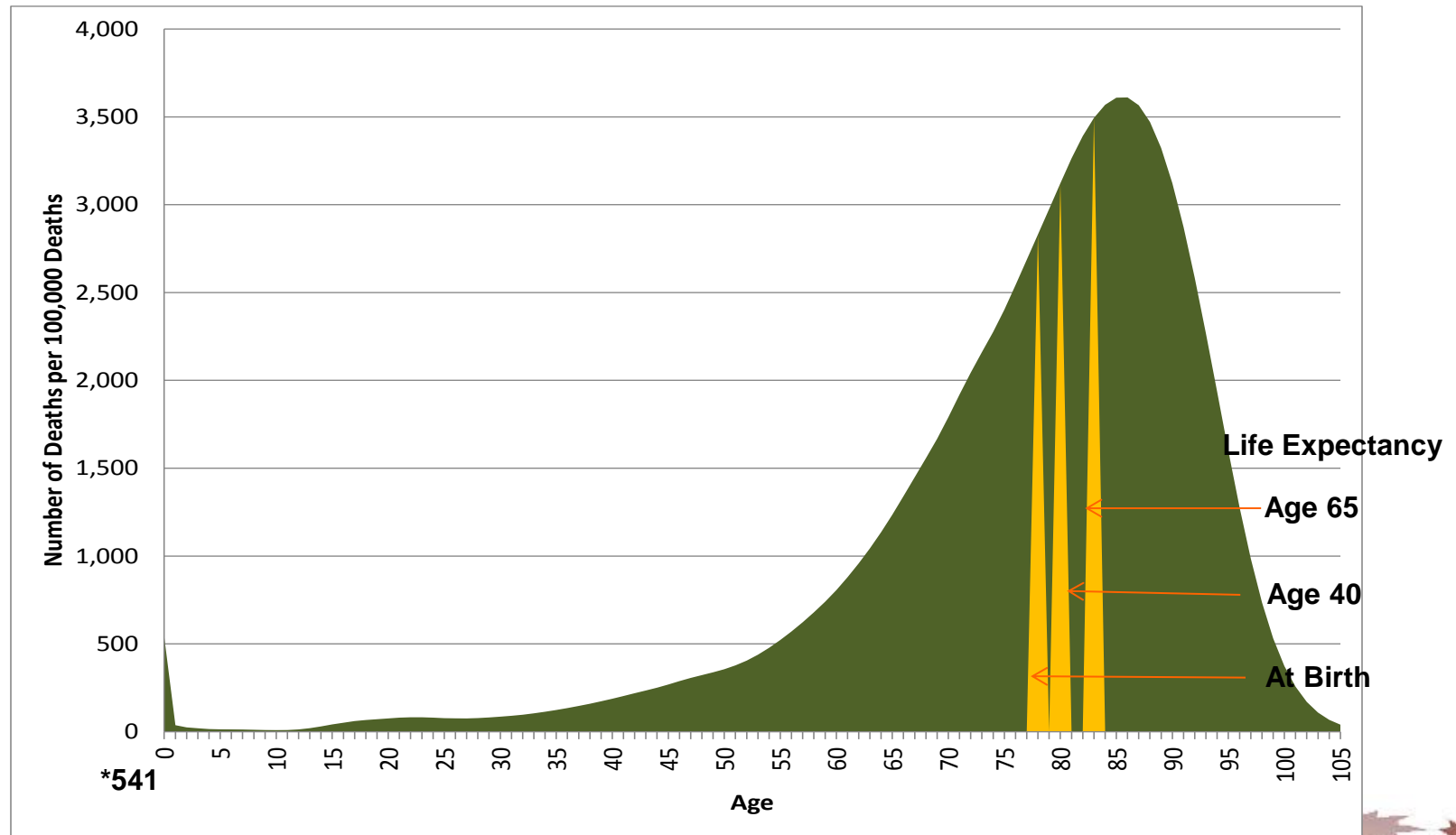
Life Expectancy – Age at Death in 1990



Life Expectancy – Age at Death in 2000



Life Expectancy – Age at Death in 2010

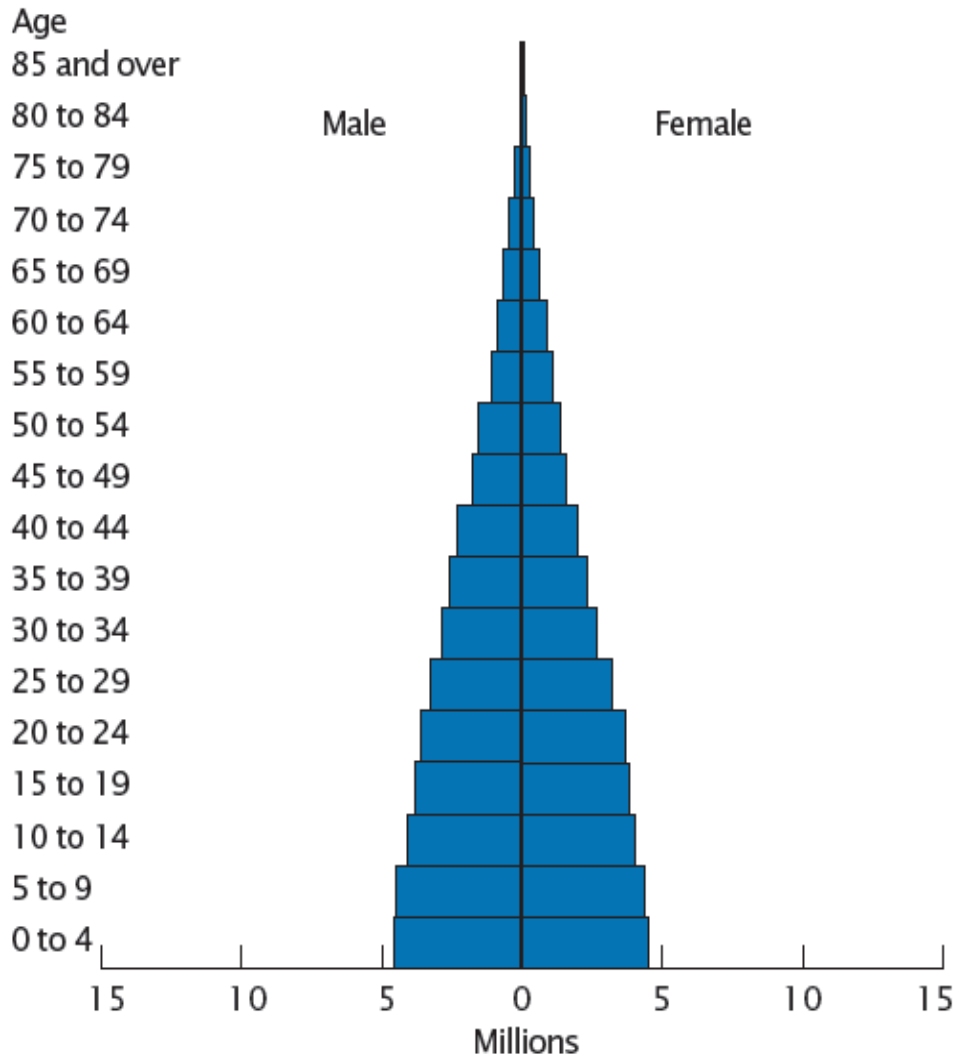


Longevity Risk

- Longevity risk is the risk that life expectancies will exceed our assumptions, resulting in greater-than-anticipated retirement cash flow needs
- For individuals, longevity risk is the risk of outliving ones' assets, resulting in a lower standard of living, reduced care, or a return to employment
- For pension plan sponsors or financial institutions, longevity risk is the risk of underestimating survival rates, resulting in increased liabilities to sufficiently cover promised payments



US Population by Age & Gender: 1900



Demography 101

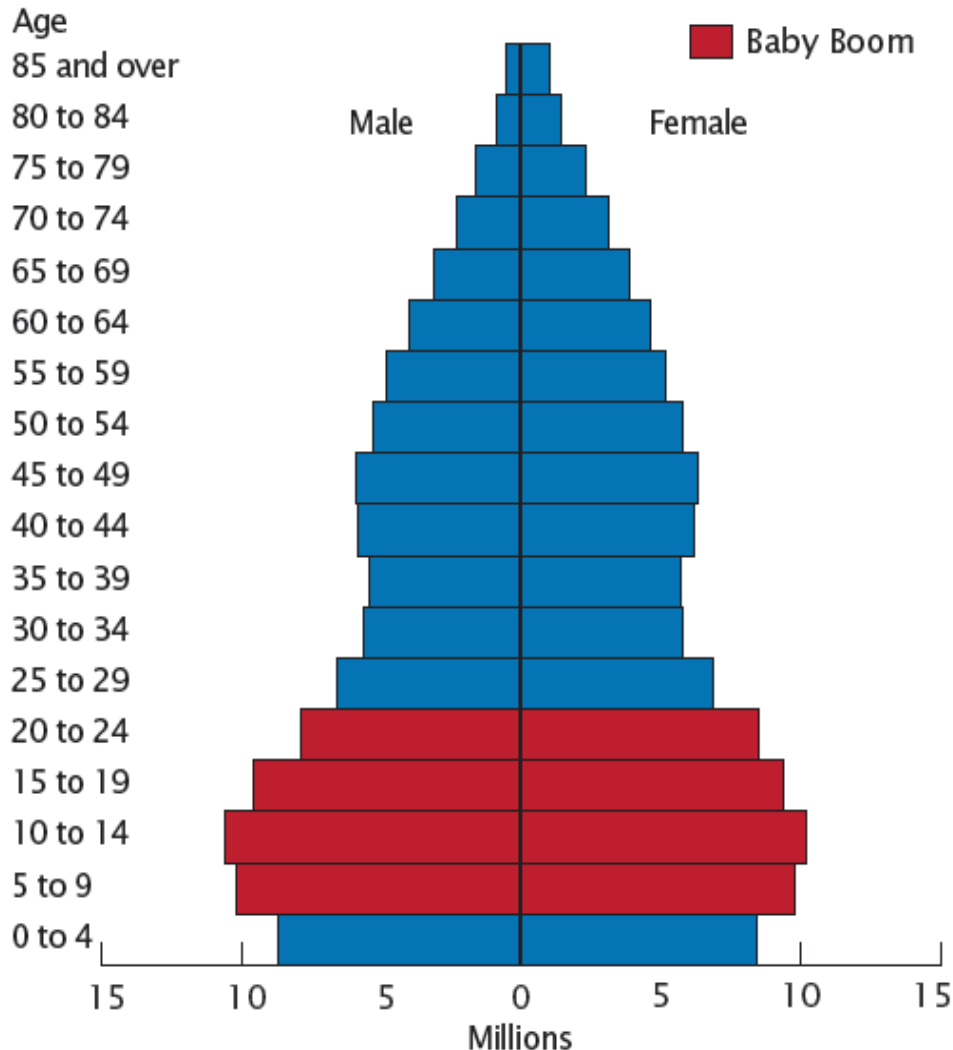
1. Fertility
2. Mortality
3. Immigration

1900 US Population

Classic pyramid shape due to high fertility and mortality



US Population by Age & Gender: 1970



Great Depression

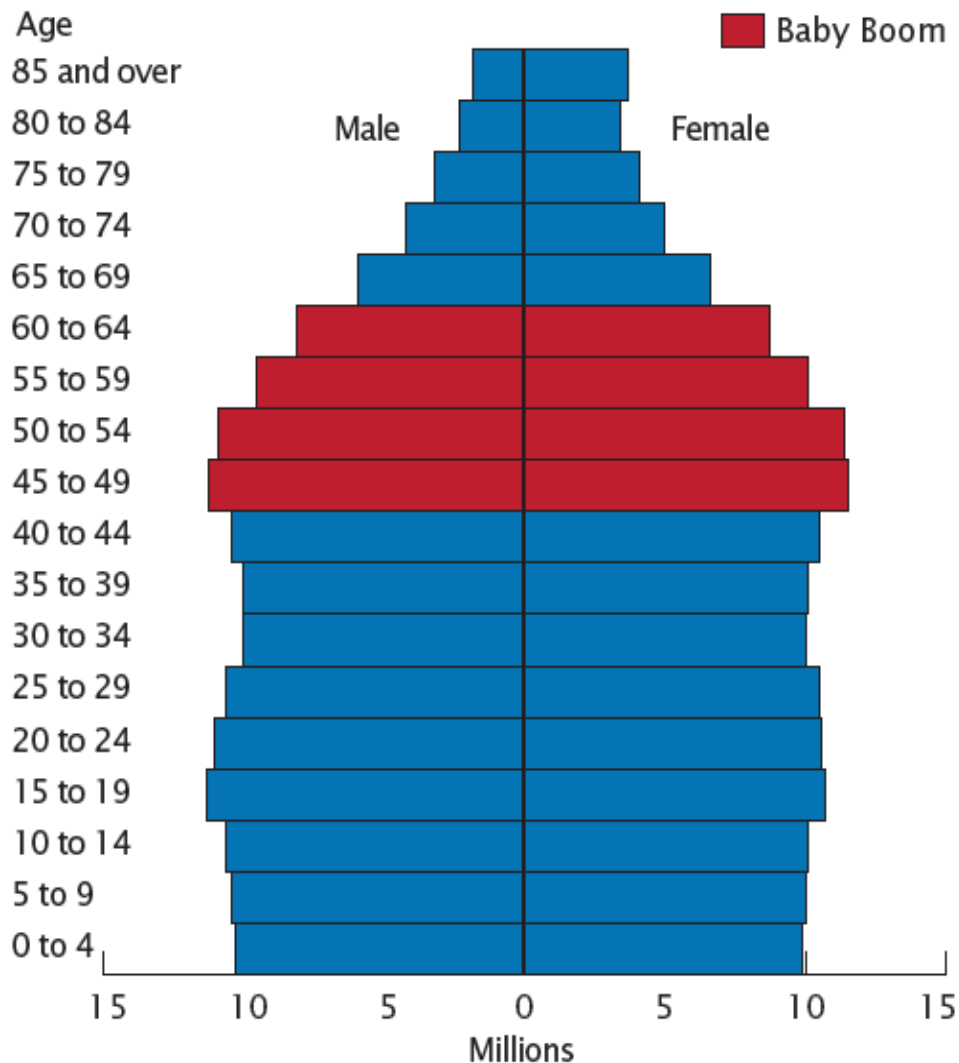
1. Births decreased
2. Those born in 1930s were 30 to 39 in 1970

Baby Boom

1. Births increased
2. Those born in 1946 to 1965 were 5 to 24 in 1970



US Population by Age & Gender: 2010

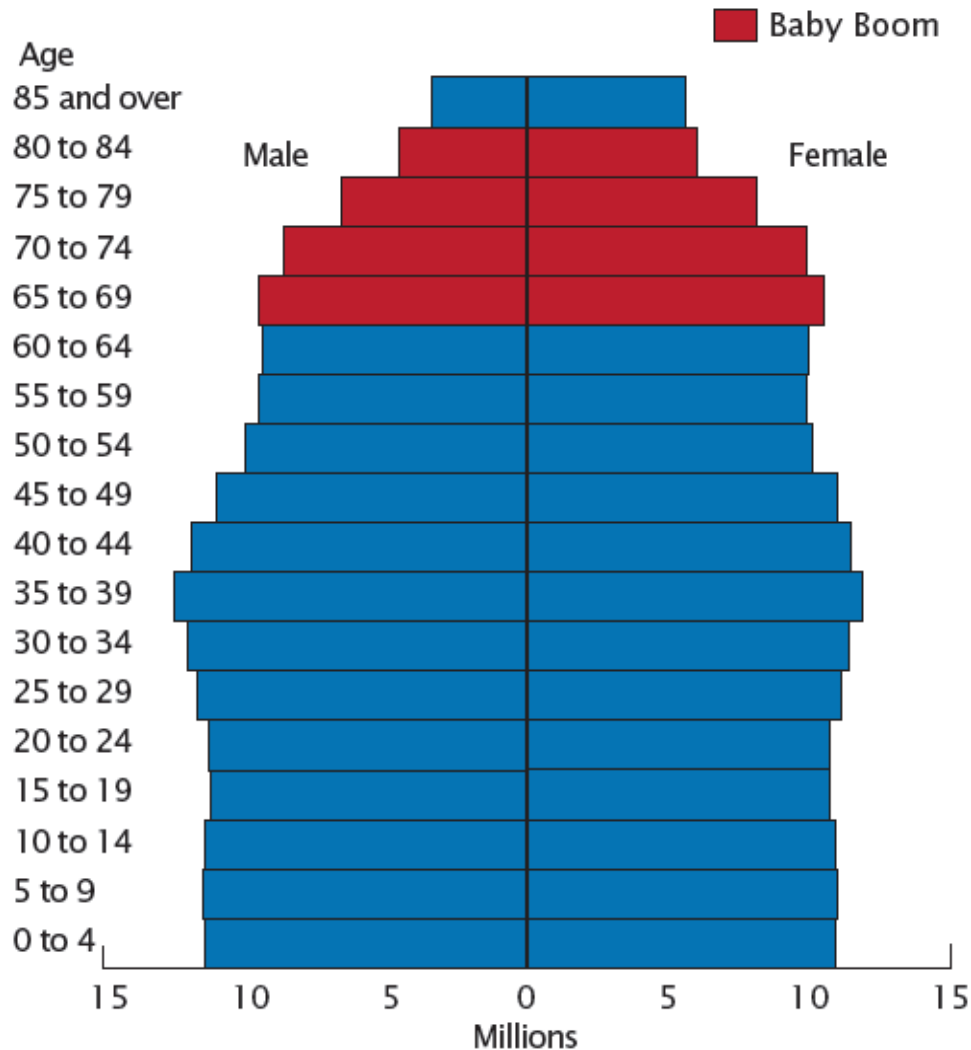


Today

1. Few retirees from 1930s births: 70 to 79 in 2010
2. Baby boom approaches retirement



US Population by Age & Gender: 2030



Tomorrow

1. Baby boom provides lots of retirees

Social impact?

1. Medical needs
2. Long-term care
3. Caregivers



The Impact of Longevity Risk


- Aging population with increasing life expectancy
- Experienced a shift in who bears the responsibility of sufficient retirement income
- Feelings of uncertainty with regard to government benefits and economic volatility



Increased Life Expectancy

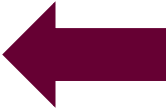
Healthy Female Retirees – Age at Death

Current age	Current Table*	“New” table**	Extra years
50	83.3	85.2	1.9
60	84.3	86.3	2.0
65	85.1	87.0	1.9



Healthy Male Retirees – Age at Death

Current age	Current Table*	“New” table**	Extra years
50	80.1	82.5	2.4
60	81.6	84.1	2.4
65	82.6	85.1	2.4



* *Current IRC Mortality*

** *RP-2014 Mortality table proposed by Society of Actuaries*



Cost of two more years to an annuitant

		Current Mortality	Increased Life Expectancy
1.	Account Balance	\$1,000,000	\$1,000,000
2.	Current Age (female)	60	60
3.	Age at Death	84	86
4.	Actuarial Factor at 4%	14.8977	15.6787
5. = 1. ÷ (4. * 12)	Monthly Annuity	\$5,600	\$5,300
6. = 5. * 25%	Taxes at 25%	\$1,400	\$1,330
7. = 5. - 6.	Cash	\$4,200	\$3,970
8. = compare values in line 7.	Decrease in monthly cash - as a percentage		\$230 5.48%



Cost of Longevity to an employer in the DC Plan

Acknowledgement:
Other employer benefit plans have a separate incremental cost impact.

	Employee who delays retirement	New Hire
Annual Salary	\$75,000	\$25,000
4% Employer Match	\$3,000	\$1,000
Incremental Savings		\$2,000

	Same Employee who delays retirement one more year	New Hire
Second Year		
Annual Salary	\$77,300	\$25,000
4% Employer Match	\$3,100	\$1,000
Incremental Savings plan cost		\$2,100
Total 2-year incremental cost		\$4,100



References:

Slides 3 to 14: Life Tables for the United States Social Security Area 1900-2100

<https://www.ssa.gov/oact/NOTES/as120/LOT.html>

Slides 16 to 19: U.S. Census Bureau, P23-212, 65+ in the United States: 2010,

June 2014

<http://www.census.gov/library/publications/2014/demo/p23-212.html>



Questions?

Happy holidays

Good health and success to all in 2016

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