Alternative Ways of Measuring Age and Their Consequences

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Alternative Ways of Measuring Age

- Preview: A year is a fine measure of time. It is not a good measure of age

- Assertion: age is strongly connected to health
  - Young people are very healthy
  - Old people are in poor health

- But, what are alternative ways of measuring age?

3 Alternatives to Years Since Birth (YSB) as Measures of Age

- Mortality Risk = chance of dying within 12 months
- Remaining Life Expectancy (RLE)
- Percent Completion of Conditional Life Expectancy

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- Mortality-based measures of age differ substantially from YSB
- Distorted impressions from using YSB as a measure of age
  - Elderly are fastest growing segment of U.S. population
  - Older U.S. men have rising labor force participation
  - Average retirement ages are roughly the same as 50 years ago
  - Prime working age adults are those between 25 & 54
- Retirement Length vs. Work Duration
- Ages that should be indexed in U.S. laws

Preliminary Thoughts on Units

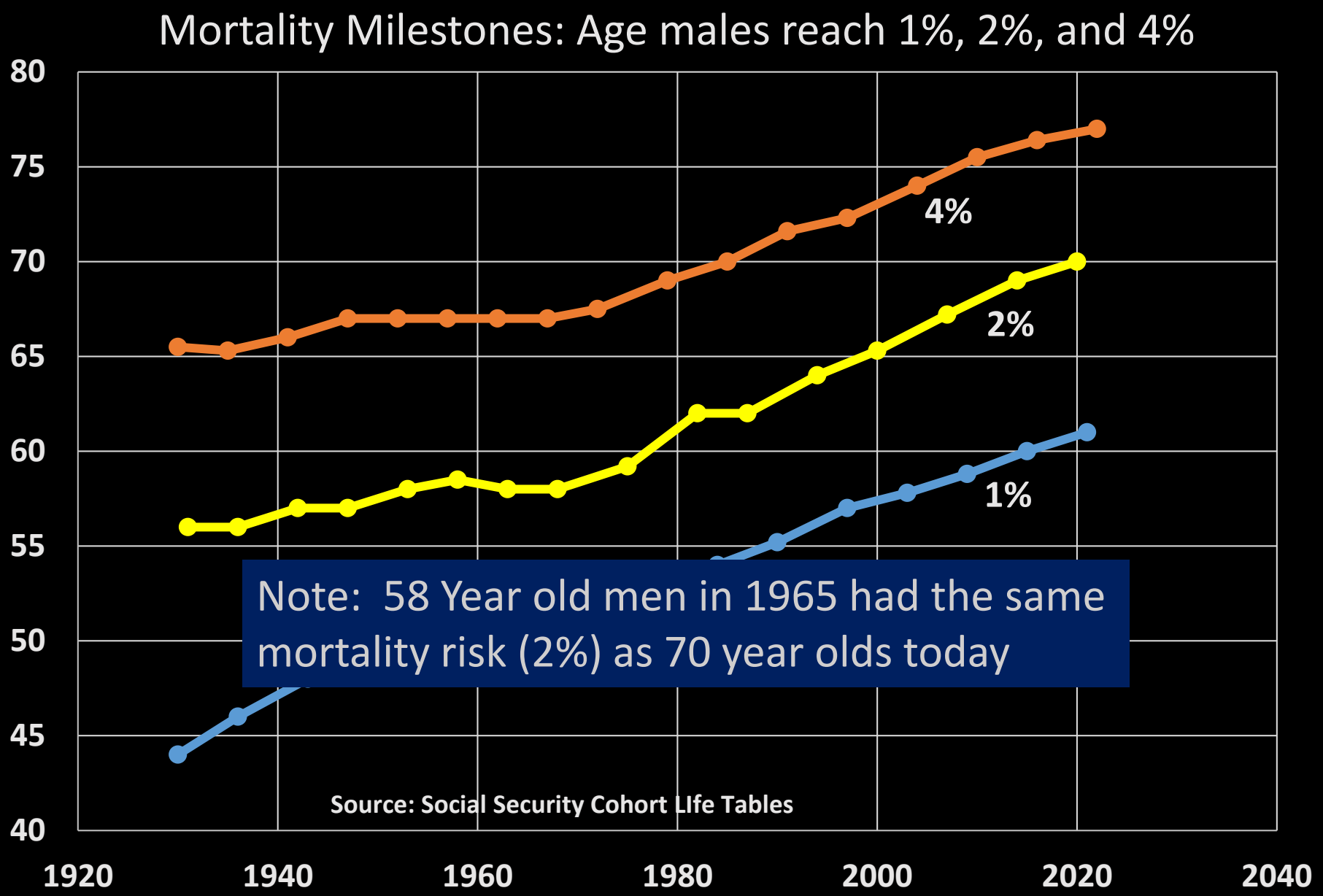
- Some measures and units are timeless
  - Degrees Celsius as measure of temperature
  - Meter as measure of length
  - Pound or Kilogram as measure of weight

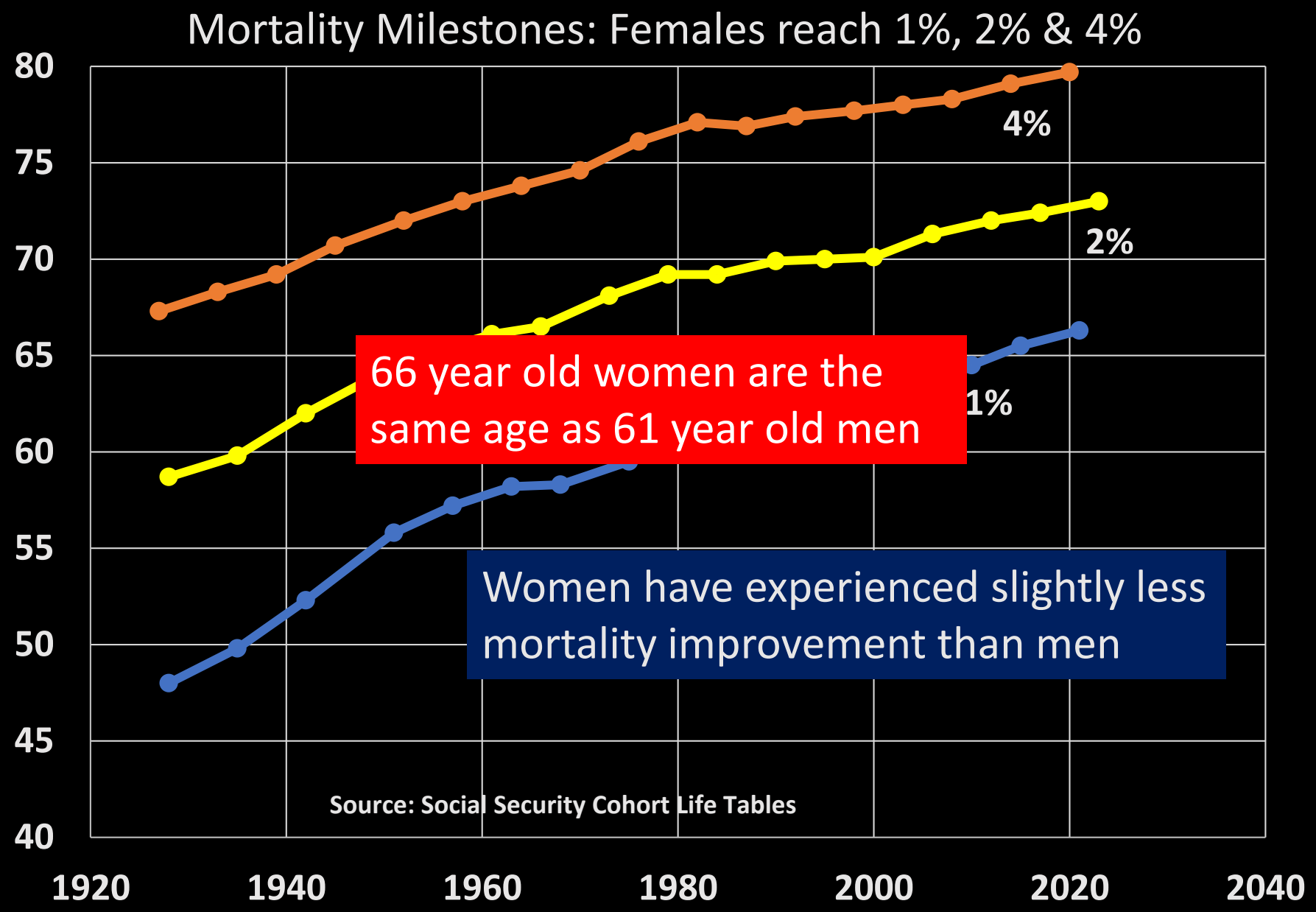
- Other measures vary with time and need to be subscripted
  - Dollars, Euros, or Yen (e.g. the need to state financial statistics in real dollars or 2005 dollars)

- Is a year of life as a measure of age a timeless unit (such as 1 meter) or a time varying unit (such as $1)?

“Mortality Milestones”

- Mortality risk rises with years since birth
- Mortality Milestones record the YSB when men and women first face mortality risks of 1%, 2% and 4%
- Assertion: People with same mortality risk enjoy roughly the same health and are thus the same age

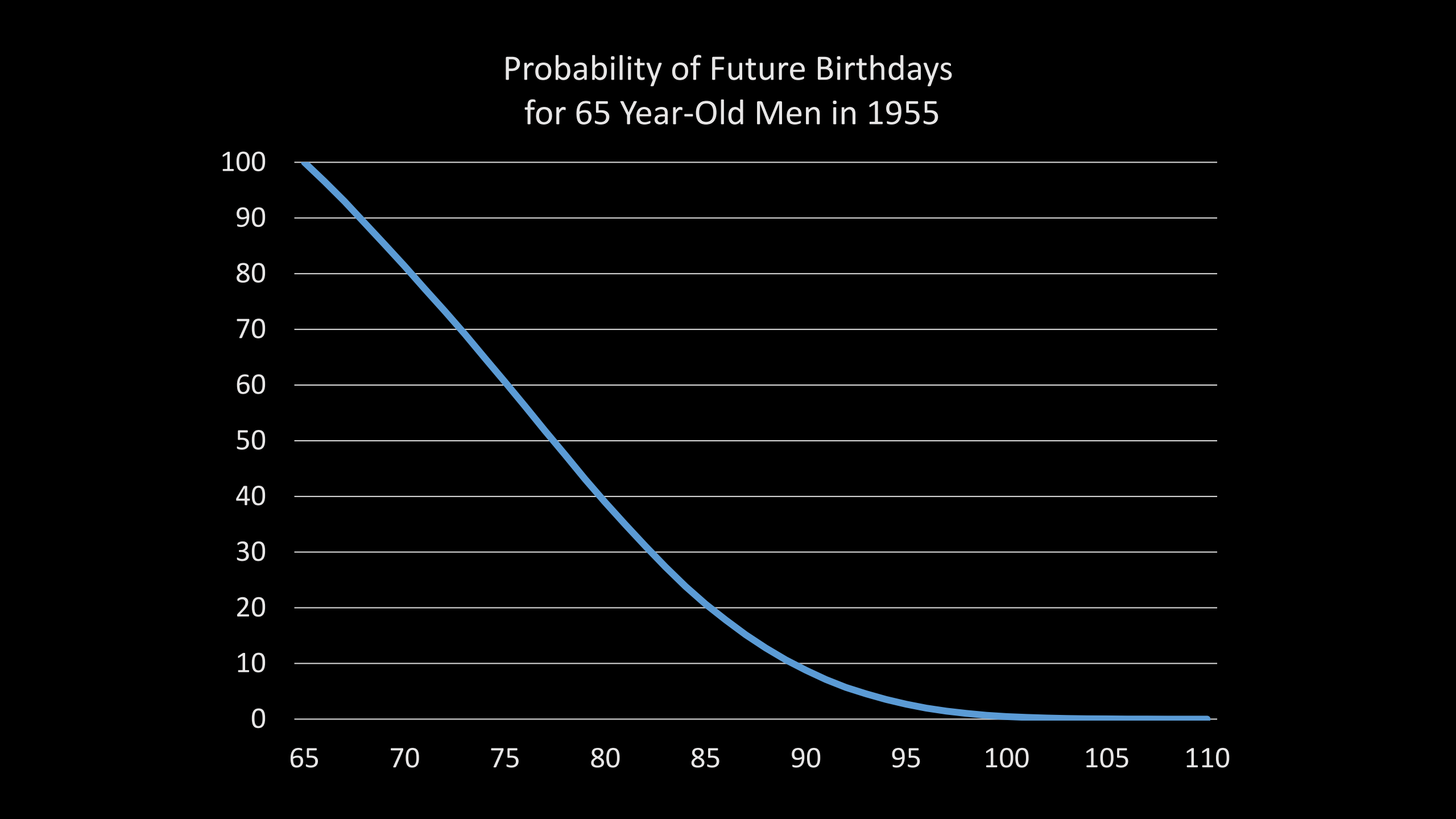

Mortality Milestones: Age males reach 1%, 2%, and 4%
80
75
70
65
60
55
50
45
40
1920
1940
1960
1980
2000
2020
2040
4%
2%
1%
Note: 58 Year old men in 1965 had the same mortality risk (2%) as 70 year olds today
Source: Social Security Cohort LIfe Tables


Mortality Milestones: Females reach 1%, 2% & 4%
80
75
70
65
60
55
50
45
40
1920
1940
1960
1980
2000
2020
2040
4%
2%
1%
66 year old women are the same age as 61 year old men
Women have experienced slightly less mortality improvement than men
Source: Social Security Cohort Life Tables

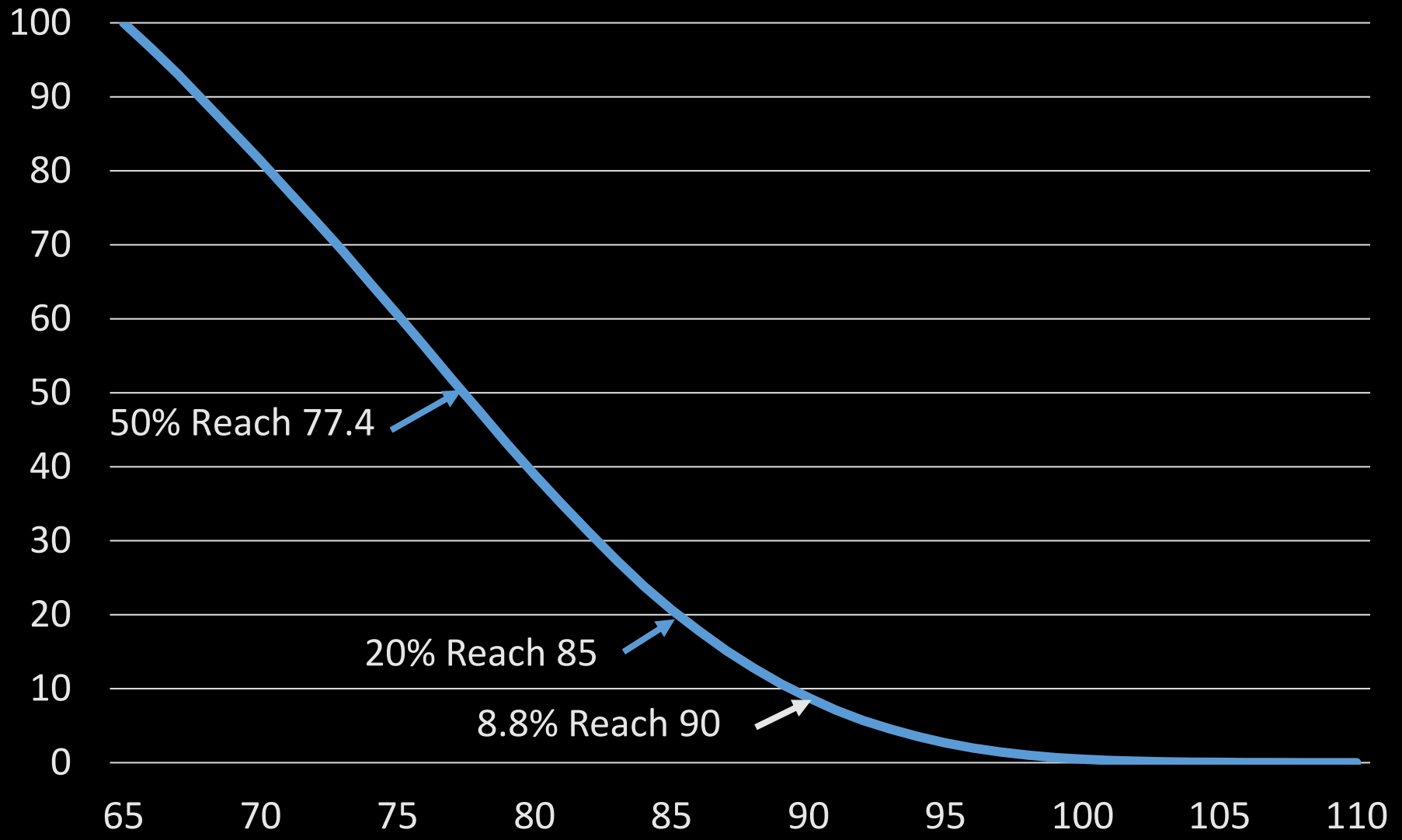
More on 65 year old men and women

- The next graphs show the probability of 65 year olds reaching future birthdays. They are survival curves.

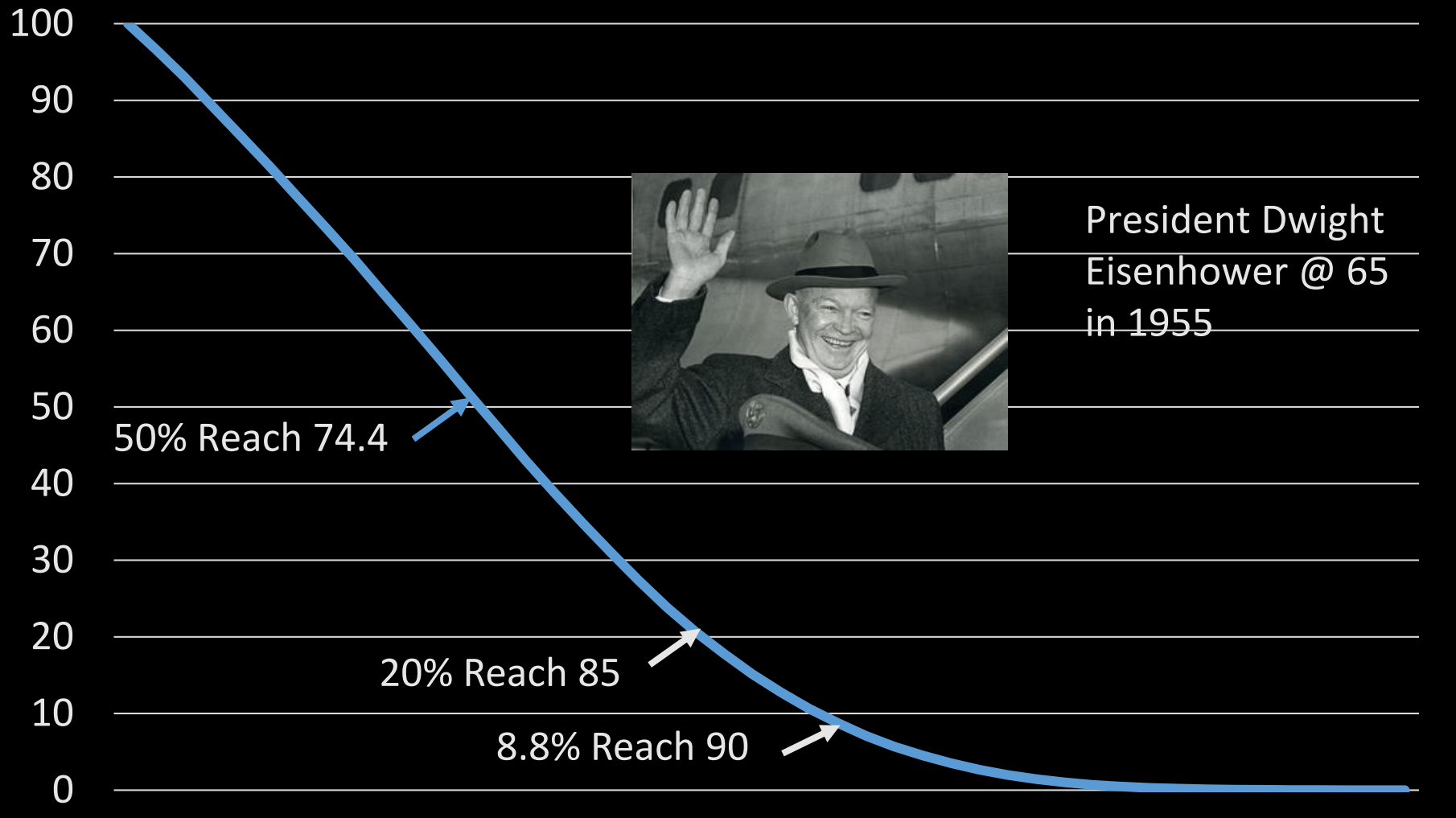
- The graphs show that 65 year old men and women at different times (1955, 2019, and 2084) are effectively very different ages

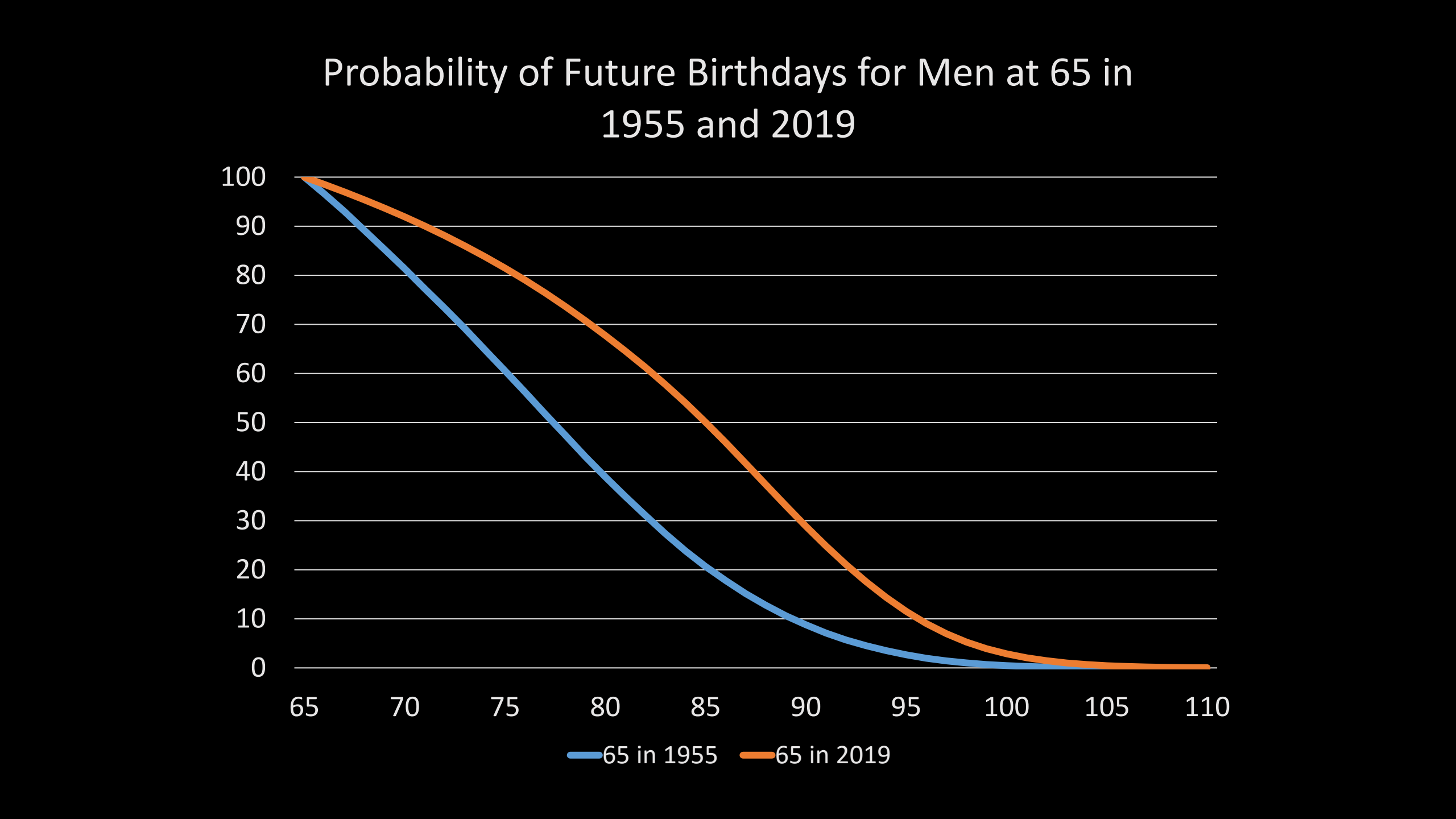

Probability of Future Birthdays
for 65 Year-Old Men in 1955
100
90
80
70
60
50
40
30
20
10
0
65
70
75
80
85
90
95
100
105
110

Probability of Future Birthdays for 65 Year-Old Men in 1955

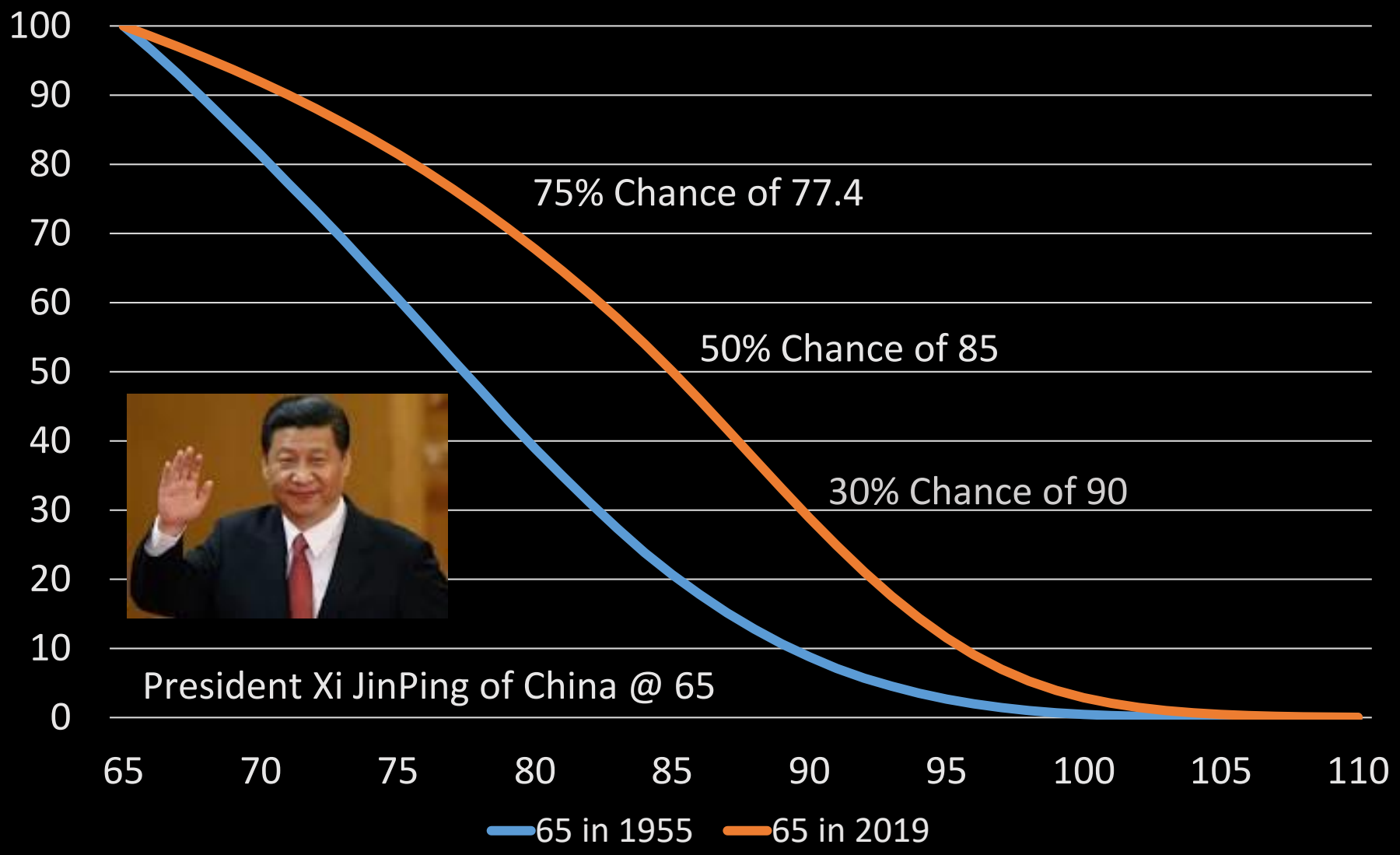


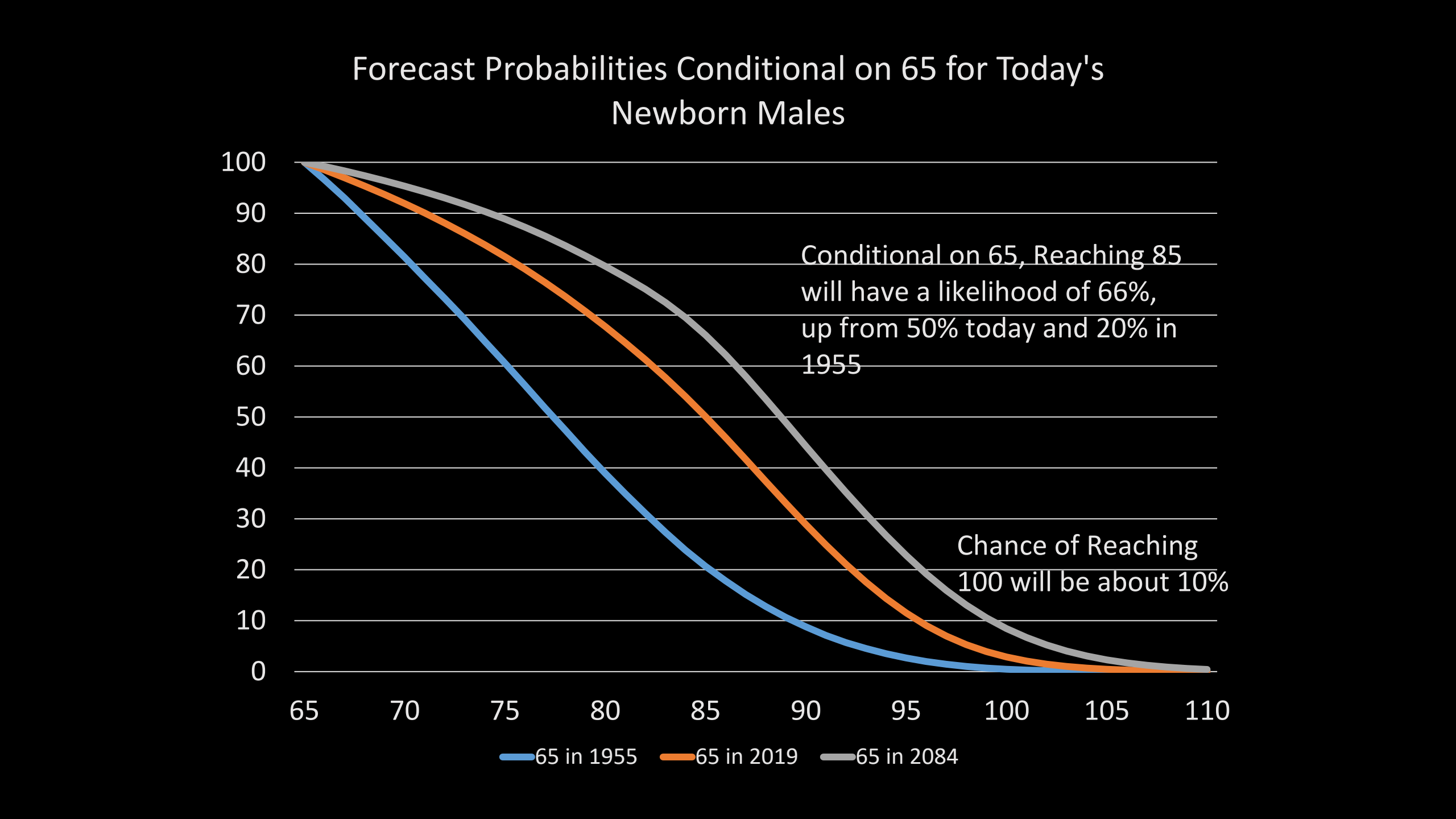
Probability of Future Birthdays for 65 Year-Old Men in 1955



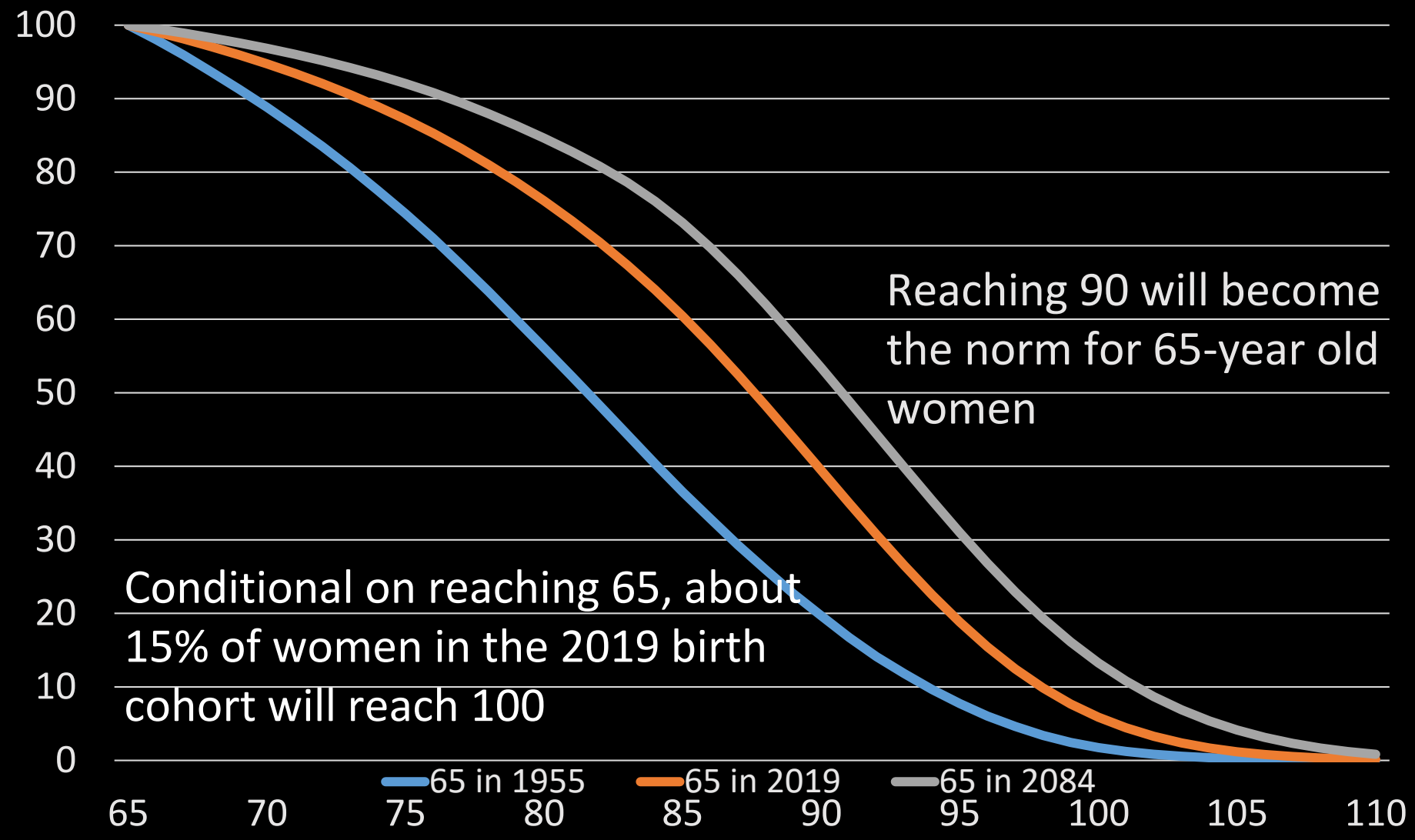

Probability of Future Birthdays for Men at 65 in 1955 and 2019
100
90
80
70
60
50
40
30
20
10
0
65
70
75
80
85
90
95
100
105
110
65 in 1955
65 in 2019

Probability of Future Birthdays for Men at 65 in 1955 and 2019




Forecast Probabilities Conditional on 65 for Today's Newborn Males
100
90
80
70
60
50
40
30
20
10
0
65
70
75
80
85
90
95
100
105
110
Conditional on 65, Reaching 85 will have a likelihood of 66%, up from 50% today and 20% in 1955
Chance of Reaching 100 will be about 10%
65 in 1955
65 in 2019
65 in 2084

The Story is Much the Same for Women



The Story is Much the Same for Women

Brigette Macron @ 65

Agatha Christie @ 65 in 1955

100
90
80
70
60
50
40
30
20
10
0

65 70 75 80 85 90 95 100 105 110

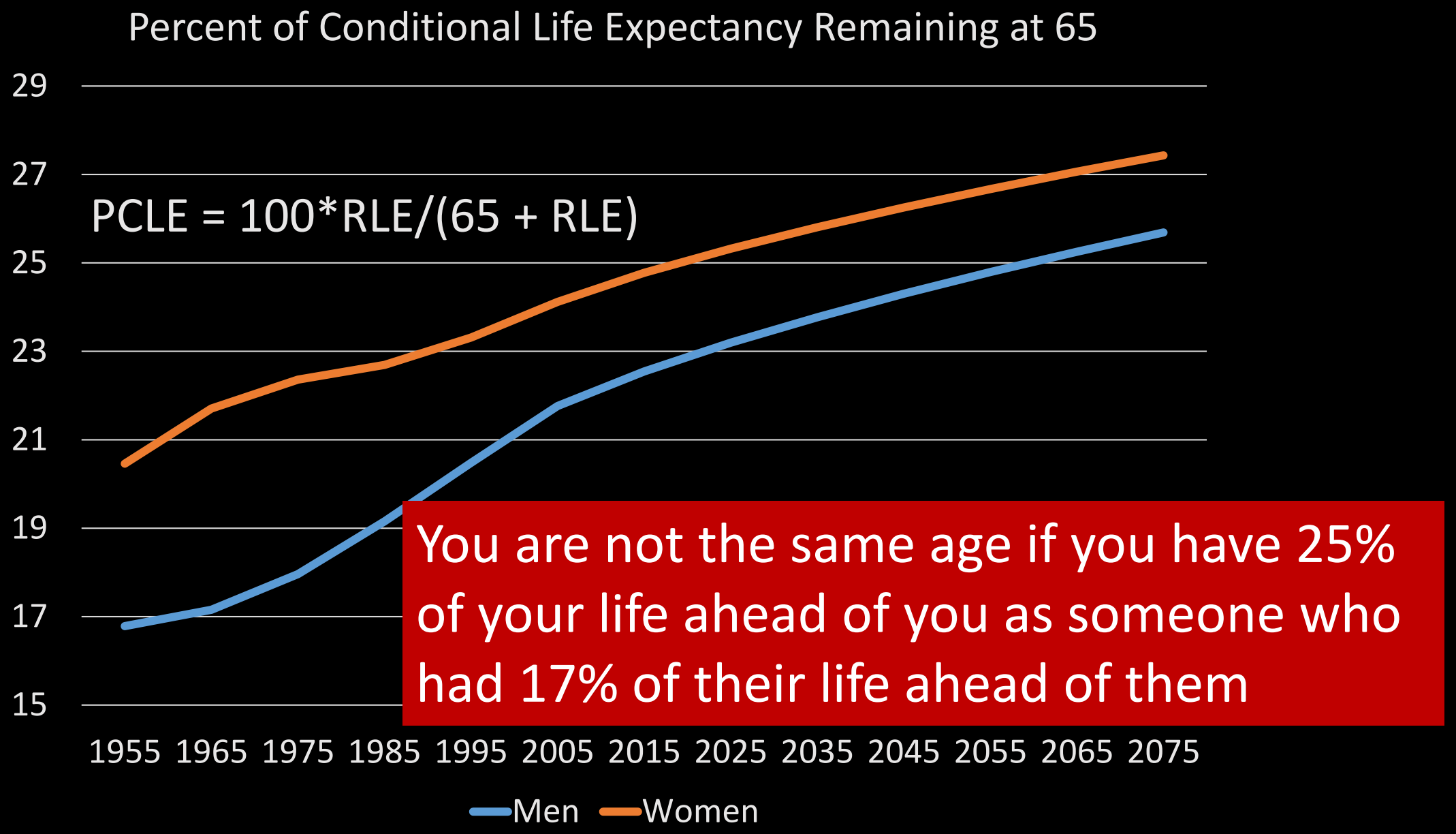
65 in 1955 65 in 2019 65 in 2084

Are These Four People the Same Age?

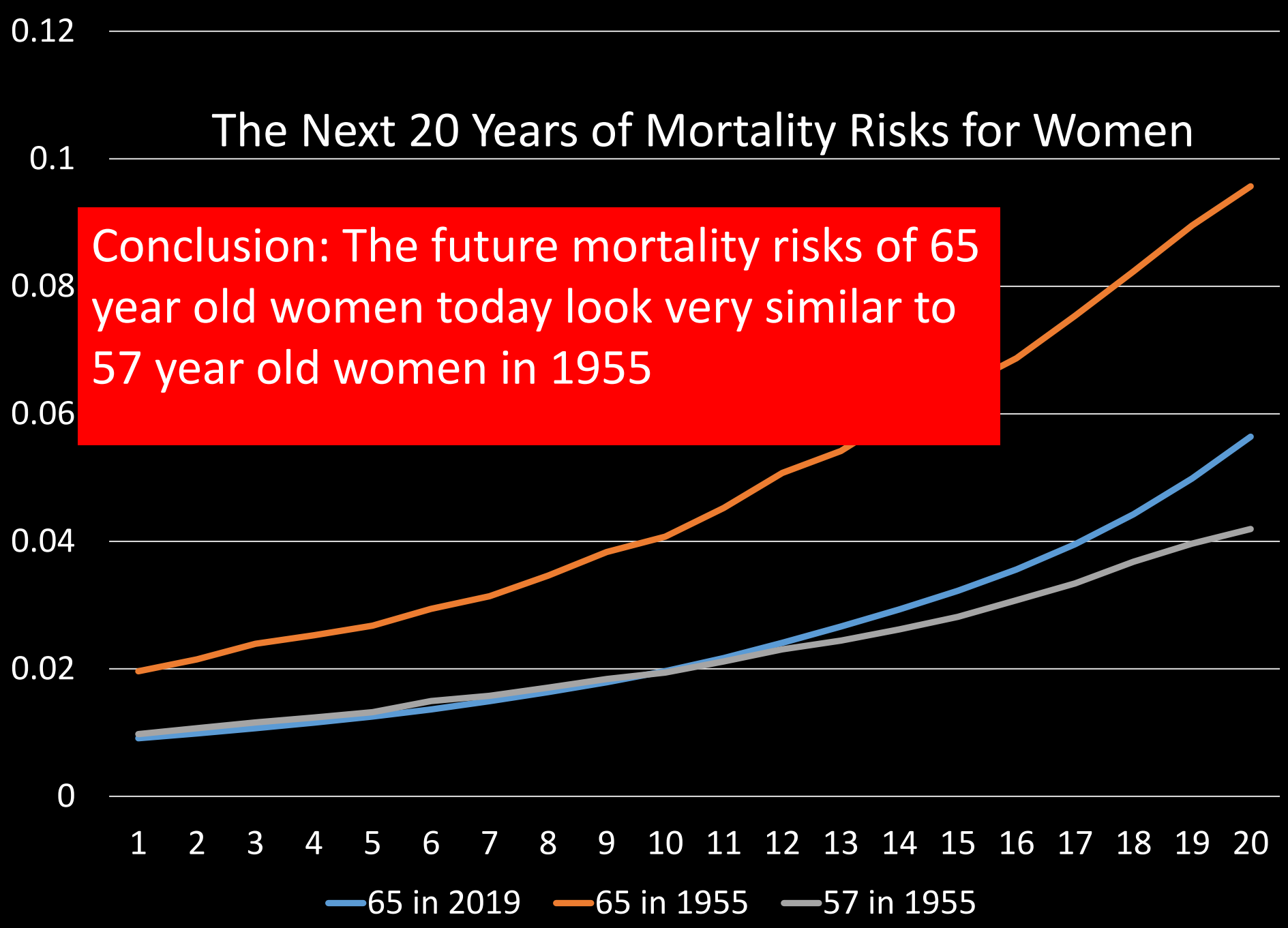
No, they are not. But they all are 65 years since birth

What fraction of your expected lifetime remains at age 65?

- The next graph will answer the question
- Keep in mind that life expectancy has been revised to take into account the fact that you made it to 65

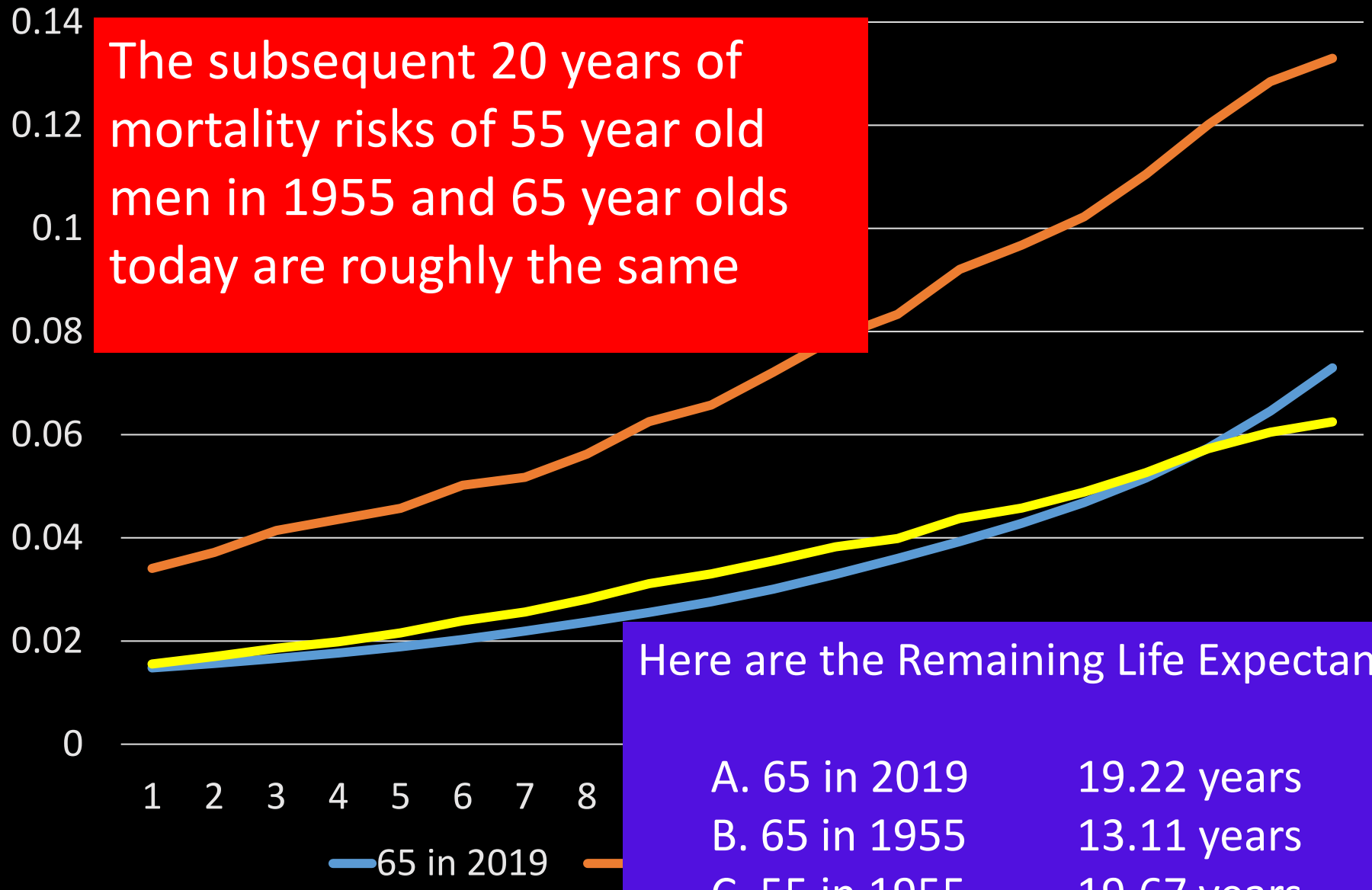

Percent of Conditional Life Expectancy Remaining at 65
29
27
25
23
21
19
17
15
PCLE = 100*RLE/(65 + RLE)
1955 1965 1975 1985 1995 2005 2015 2025 2035 2045 2055 2065 2075
Men
Women
You are not the same age if you have 25% of your life ahead of you as someone who had 17% of their life ahead of them

Next we look at the next 20 years of annual mortality risks faced by 65 year old women


The Next 20 Years of Mortality Risks for Women
Conclusion: The future mortality risks of 65 year old women today look very similar to 57 year old women in 1955
0.12
0.1
0.08
0.06
0.04
0.02
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
65 in 2019
65 in 1955
57 in 1955

Now, let’s look at the next 20 years of annual mortality risks faced by 65 year old men

The Next 20 Years of Mortality Risks for Men



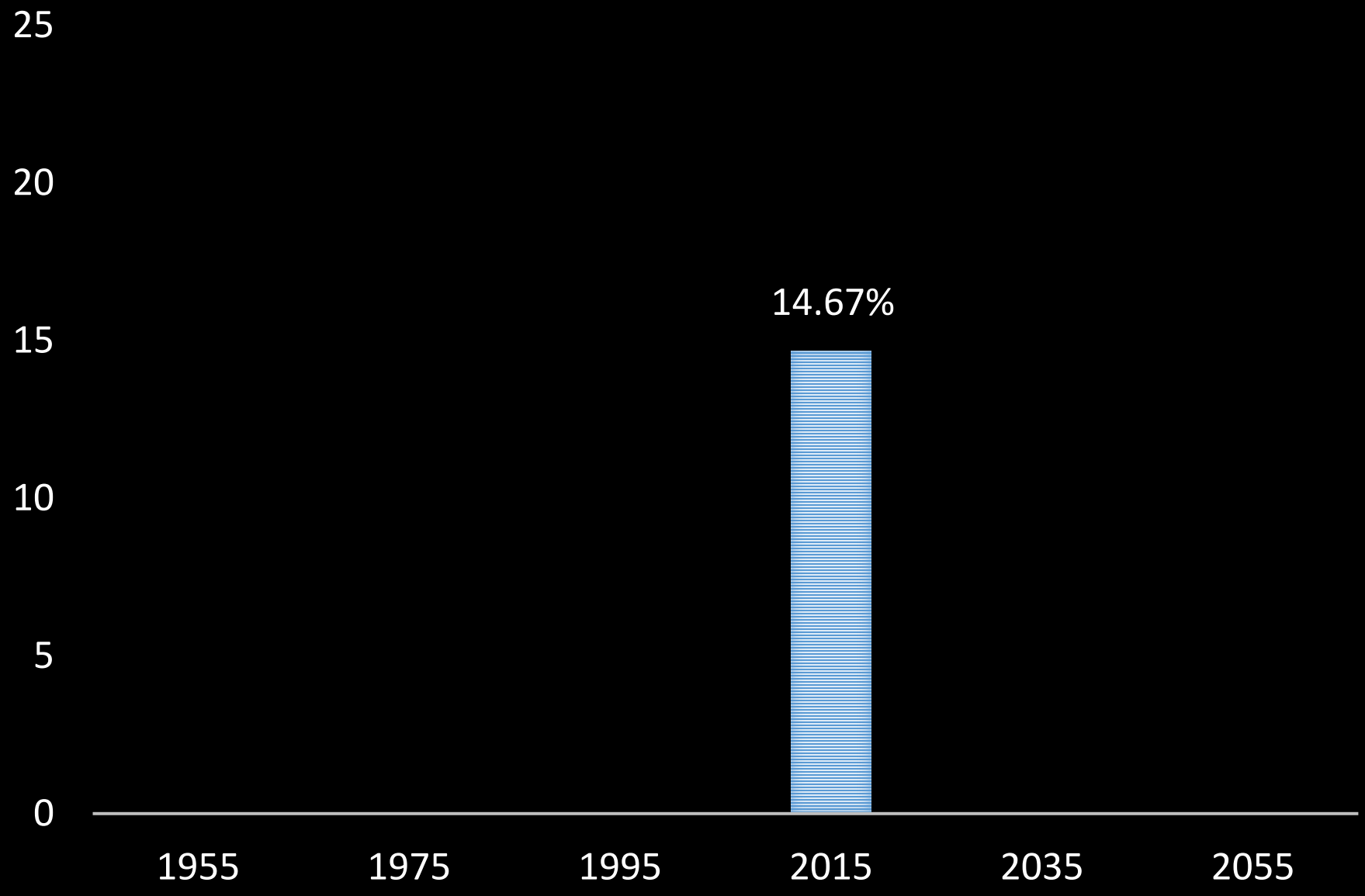
The subsequent 20 years of mortality risks of 55 year old men in 1955 and 65 year olds today are roughly the same

Here are the Remaining Life Expectancies and mortality risks

A. 65 in 2019	19.22 years	1.48%
B. 65 in 1955	13.11 years	3.41%
C. 55 in 1955	19.67 years	1.56%

Now, let’s examine what percentage of the U.S. population are elderly

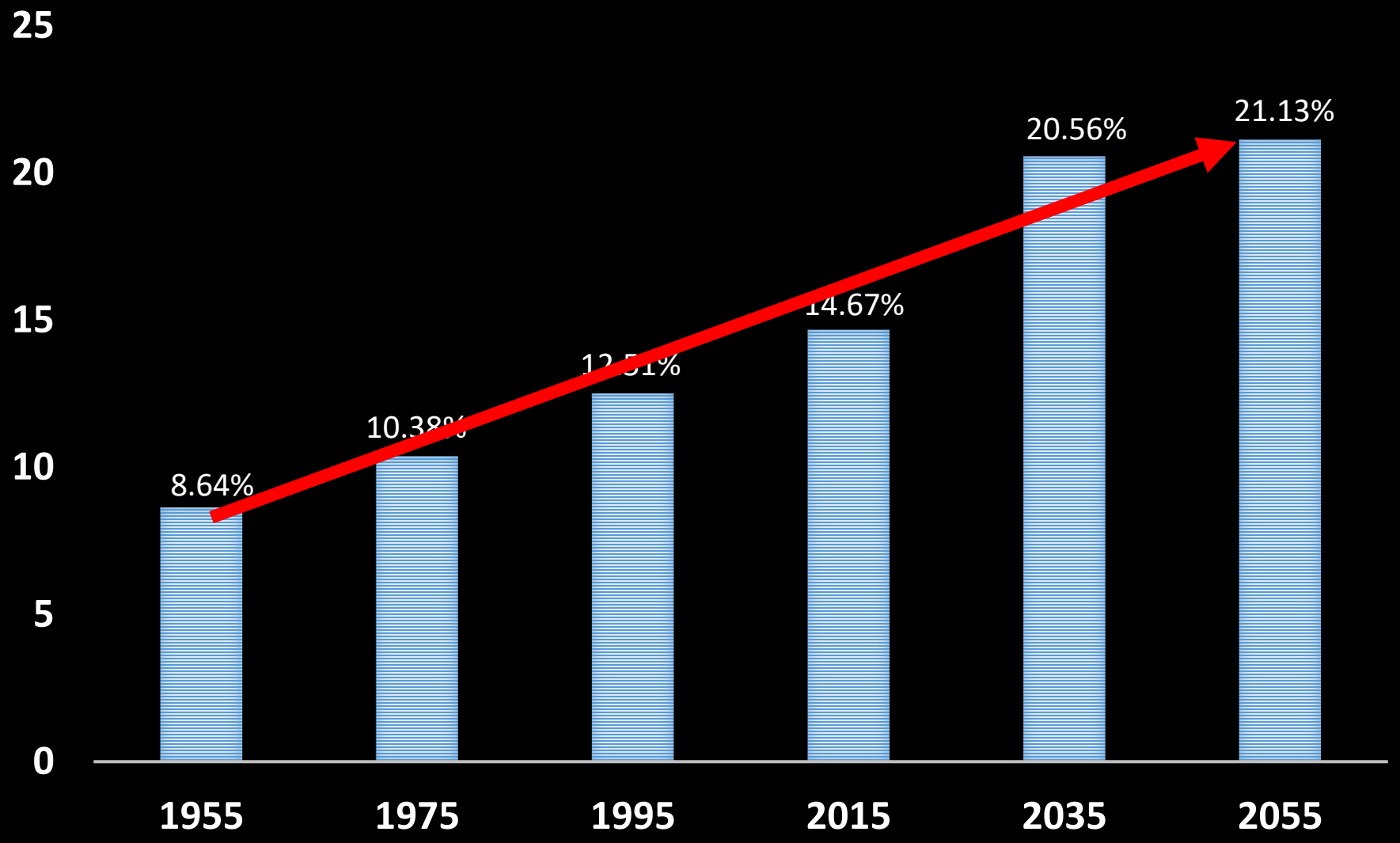
PERCENT OF U.S. POPULATION 65+ IN 2015



Conventional Wisdom: 14.67% of U.S. Population was Elderly in 2015

- Now, let's look at how this percentage has and will evolve over the period 1955 - 2055

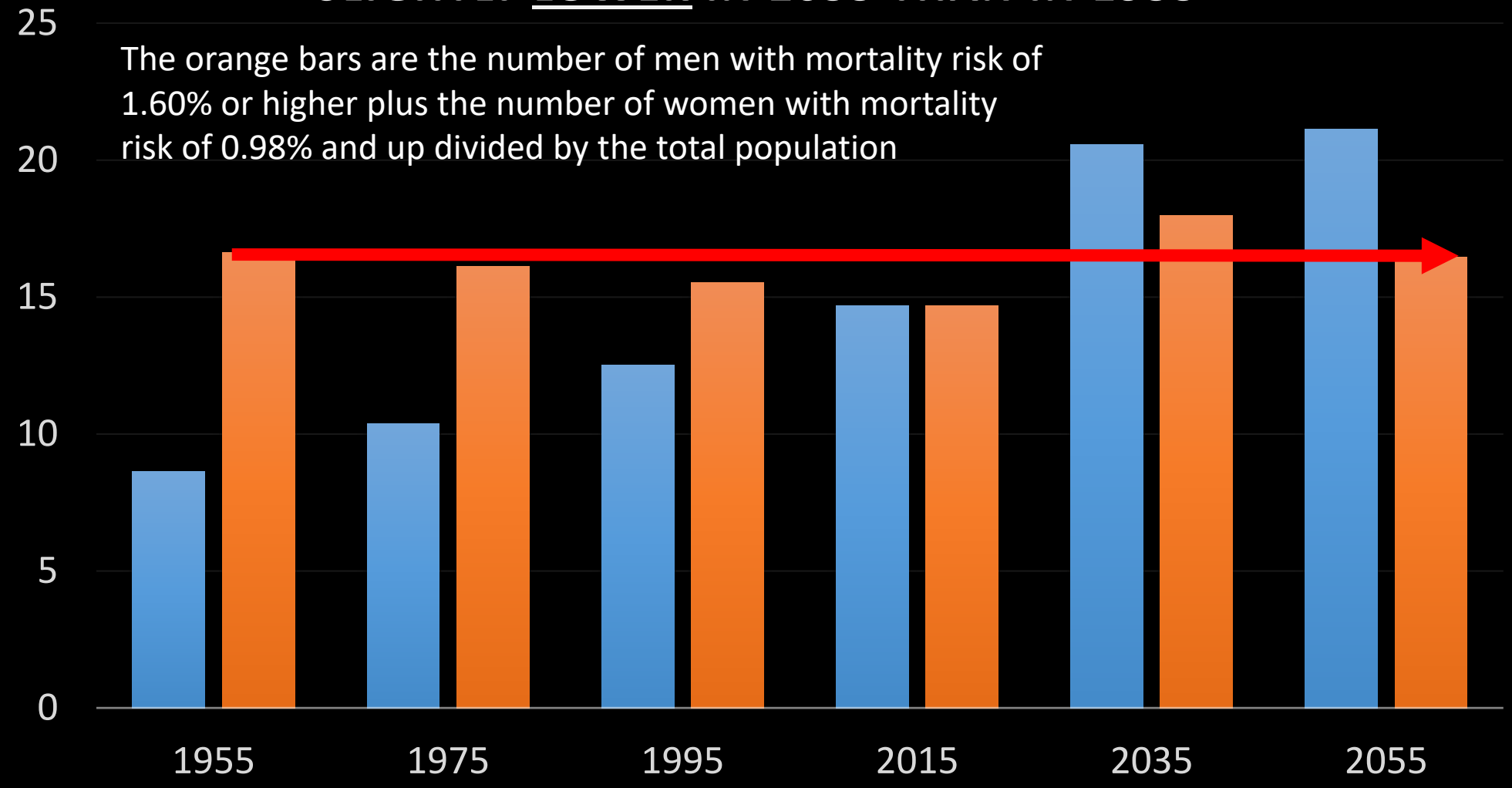
PERCENT OF U.S. POPULTION 65+
THE AGING OF AMERICA



Conventional Wisdom: % of the Population that is Elderly will be 145% higher in 2055 than in 1955

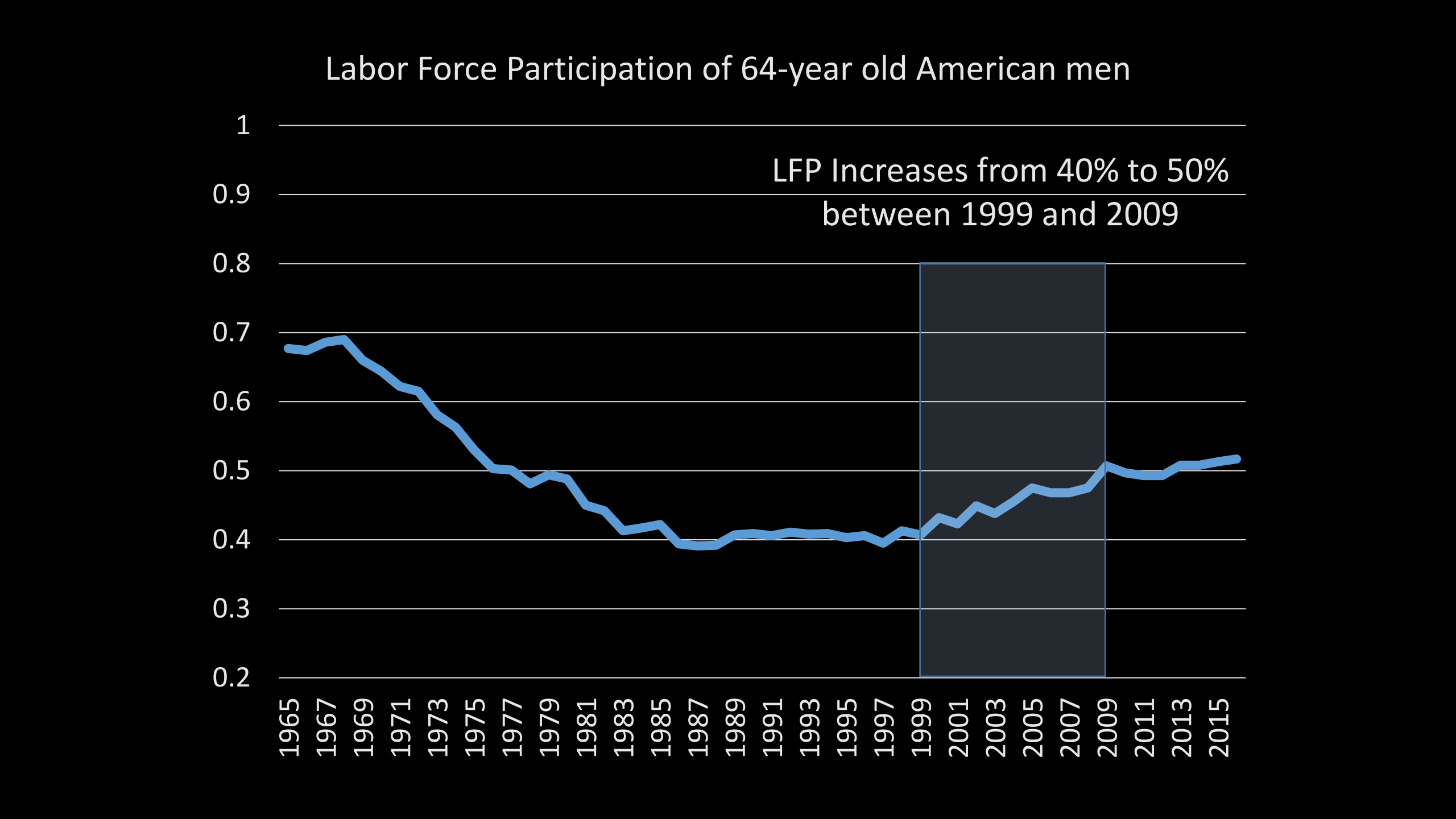
- 21.13/8.64 = 2.45 or 145% growth
- Conclusion: over the century, the fraction of the population that is elderly will grow dramatically
- “The fastest growing segment of the population is the elderly”
- But, is it true?

PERCENT OF U.S. POPULATION WITH MORTALITY OF 2015 65 YEAR-OLDS OR WORSE IS PROJECTED TO BE SLIGHTLY LOWER IN 2055 THAN IN 1955

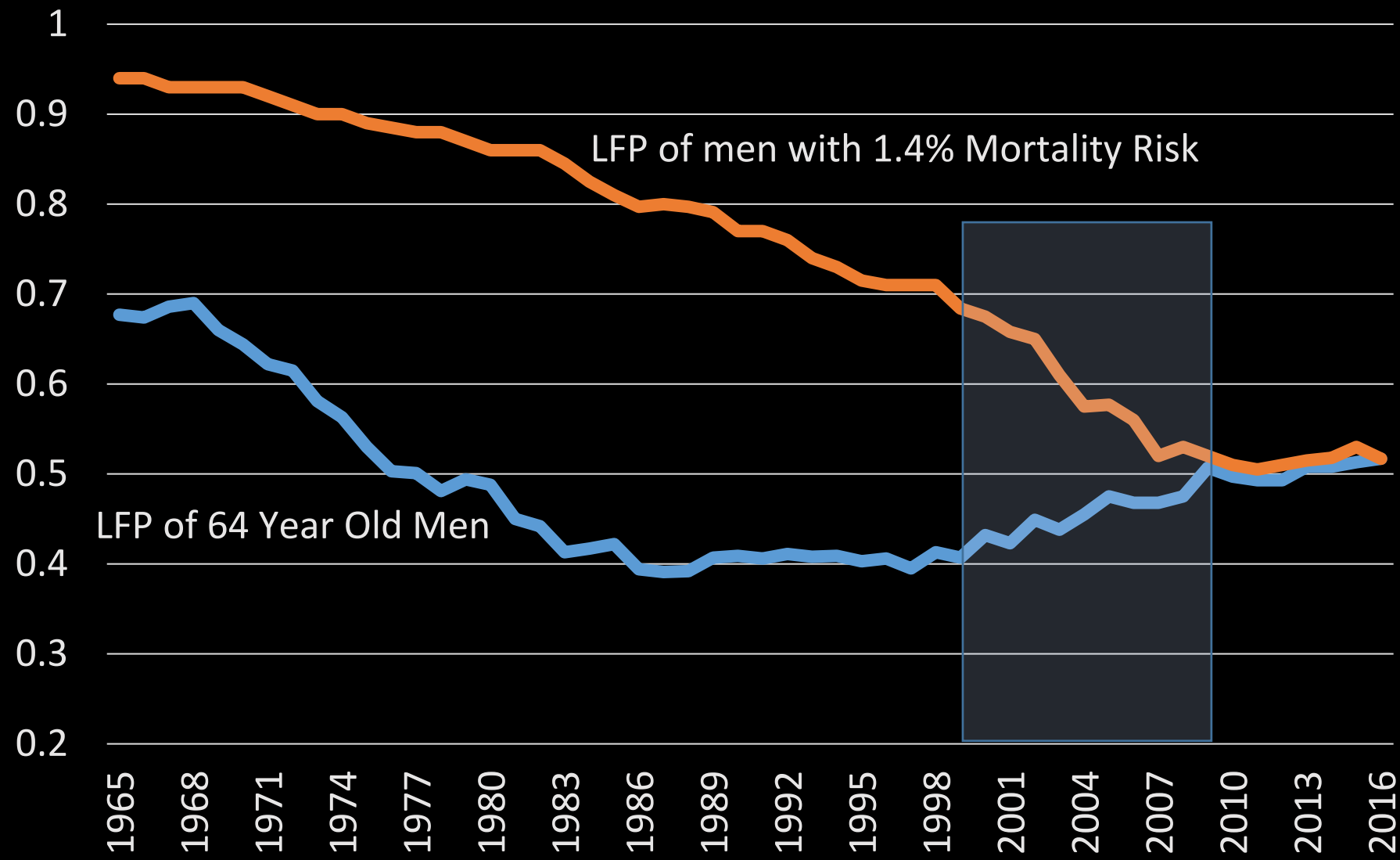


Slightly smaller % of the population will have mortality of today's 65+ population in 2055 than in 1955

- Elderly were a *smaller* % of U.S. population in 2015 than in 1955 if you use mortality risk to measure age!
- The dramatic aging of America is due to how we measure (or mismeasure) age
- If we measure age by health and health by mortality risk, then there is not any dramatic change in % of the population that is elderly
- A year is a good measure of time, but a poor measure of age


Labor Force Participation of 64-year old American men
LFP Increases from 40% to 50%
between 1999 and 2009
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015

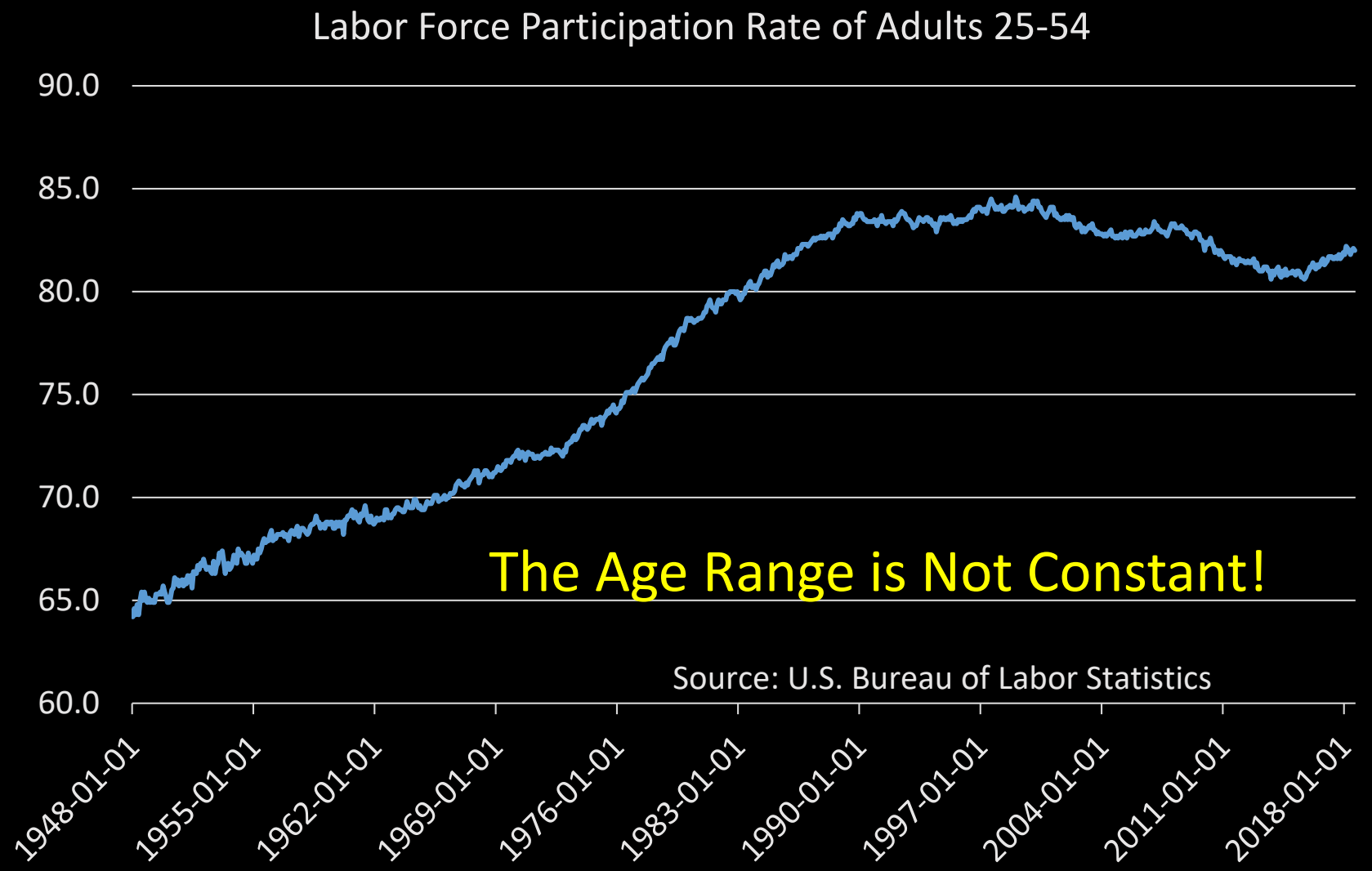
Are Older American Men Working More?



Are Elderly Men Working More or Not?

- It depends on how you measure age.
- By conventional “Years Since Birth” such as 64, a higher fraction of men were in the workforce in 2009 than in 1999
- However, if you measure age by mortality risk, then a lower fraction of elderly men were working in 2009 than in 1999

What's Wrong with this Graph?



What do you mean, the age range is not constant?

- The upper cutoff was 54 in 1948, when 54 year old males had a mortality rate of 1.64% and a RLE of 20 years
- The upper cutoff is 54 in 2019, when 54 year old males had a mortality rate of 0.69% and a RLE of 28.5 years
- The early years includes much older people than the more recent years

Average Retirement Age for Men in the U.S.

1910	**74**
1940	70
1970	65
2000	62
2019	64

Average retirement age for men has not changed much since 1970 using YSB to measure age. But, mortality-based measures would indicate that the average retiree is much younger.

Length of Retirement for 64 Year Old Husband, 62 Year Old Wife

- The second death of the couple is likely to take place 28-32 years after retirement
- Unfortunately, it is almost impossible to finance a 30 Year Retirement with a 40 Year Career

The U.S. Needs to Stop Discouraging Work for Those Over 62

- Possible Ideas:

- Increase when retirement assets can be accessed from 59.5 to 62
- Eliminate the Social Security Earnings Test
- Establish a new category of worker called “Paid Up”
- Let 65+ keep their Medicare (national health insurance) coverage whether they work or not
- Significantly raise age at which you must start withdrawals from retirement accounts (e.g. from 70.5 to 80)

The Retirement Crisis in America is Partly Due to Who We Treat As Elderly

- The retirement crisis refers to fact that households, state governments and the federal government cannot finance retirements lasting 30 years

- We should encourage work for those 65 -75. They are not nearly as old as 65-75 year olds used to be!