Historical Data

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Data Sources

- ## Under age 65

  – Death counts from the National Center for Health Statistics.

  – Population counts from the Census Bureau.

  – For the 2019 Trustees Report, we had final data through 2016.

- ## Ages 65 and older

  – Death counts from the Medicare enrollment population.

  – Population counts from the Medicare enrollment population.

  – For the 2019 Trustees Report, we had final data through 2015, and preliminary data for 2016 and 2017.

Medicare Data – Why?

- Medicare enrollment population is about 90+% of the Census population.

- Medicare data is generally considered advantageous:

    – Single data source for numerator (deaths) and denominators (population).

    – Undercount/overcount issue is greatly reduced.
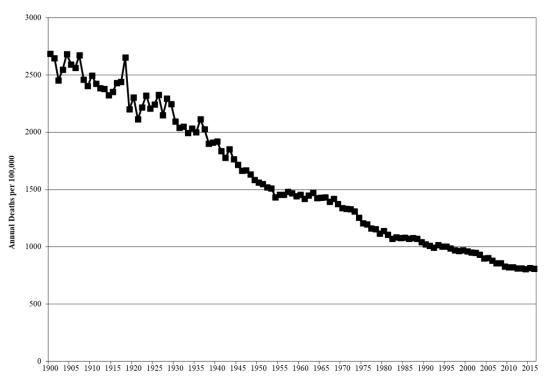
    – More accurate age reporting.

Central Death Rates

- Central death rate is the number of deaths in a year divided by the midyear population.

- Calculate central death rates for 5-year age groups, and also calculate age-adjusted (and age-sex-adjusted) central death rates.

- The historical central death rates form the basis for our projections.

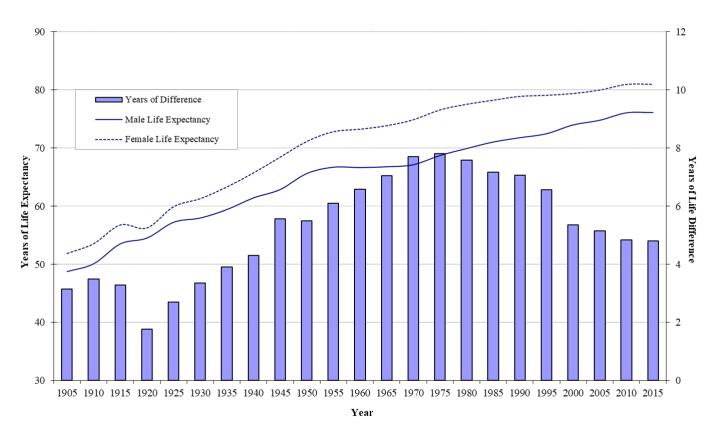# Historical Age-Sex-Adjusted Death Rates, 1900 - 2016

Average Annual Percent Reductions in Age-Adjusted Central Death Rates: for the 2019 Trustees Report [1]

Sex	Age	Historical Period (last year of final data is 2016)								Intermediate Alternative		
		1900-1936	1936-1954	1954-1968	1968-1982	1982-1999	1999-2009	2009-2016	1900-2016	2016-2043	2016-2093	2043-2093
Male	0-14	2.91	4.79	1.65	4.33	2.91	1.29	1.30	2.99	1.65	1.58	1.54
	15-49	1.46	3.01	-0.25	2.21	0.65	0.80	-0.66	1.29	0.91	0.88	0.86
	50-64	0.42	0.96	-0.13	2.28	1.92	1.15	-0.29	0.90	1.09	1.07	1.06
	65-84	0.20	1.16	-0.11	1.46	1.25	2.40	0.86	0.85	1.00	0.86	0.78
	85+	0.22	1.21	-0.89	1.56	-0.29	1.49	0.37	0.45	0.58	0.54	0.52
	65+	0.21	1.17	-0.37	1.50	0.70	2.03	0.65	0.70	0.82	0.72	0.66
	Total	0.67	1.49	-0.25	1.78	0.94	1.76	0.37	0.94	0.88	0.80	0.75
Female	0-14	3.14	5.06	1.72	4.15	2.63	1.12	1.13	3.03	1.66	1.60	1.57
	15-49	1.53	4.68	0.28	2.91	0.59	0.26	-0.47	1.68	0.91	0.92	0.93
	50-64	0.71	2.57	0.76	1.72	1.09	1.46	-0.46	1.18	1.06	1.06	1.05
	65-84	0.35	2.05	1.06	2.03	0.46	1.68	0.72	1.06	0.91	0.79	0.73
	85+	0.23	1.21	0.13	2.06	-0.14	1.16	0.16	0.62	0.54	0.51	0.50
	65+	0.31	1.74	0.69	2.04	0.22	1.45	0.47	0.88	0.74	0.66	0.61
	Total	0.79	2.31	0.70	2.11	0.43	1.37	0.27	1.14	0.81	0.74	0.70
Total	0-14	3.01	4.90	1.68	4.26	2.79	1.22	1.23	3.01	1.66	1.59	1.55
	15-49	1.49	3.69	-0.06	2.44	0.63	0.61	-0.60	1.44	0.91	0.90	0.89
	50-64	0.55	1.62	0.19	2.08	1.61	1.27	-0.35	1.02	1.08	1.07	1.06
	65-84	0.28	1.60	0.42	1.72	0.92	2.06	0.79	0.96	0.95	0.83	0.76
	85+	0.23	1.21	-0.22	1.86	-0.18	1.30	0.24	0.56	0.56	0.52	0.51
	65+	0.26	1.46	0.19	1.77	0.51	1.75	0.56	0.81	0.78	0.69	0.64
	Total	0.73	1.88	0.22	1.95	0.75	1.57	0.31	1.05	0.85	0.77	0.73

[1] Using the 2010 Census Resident population as the standard population for age adjusting.
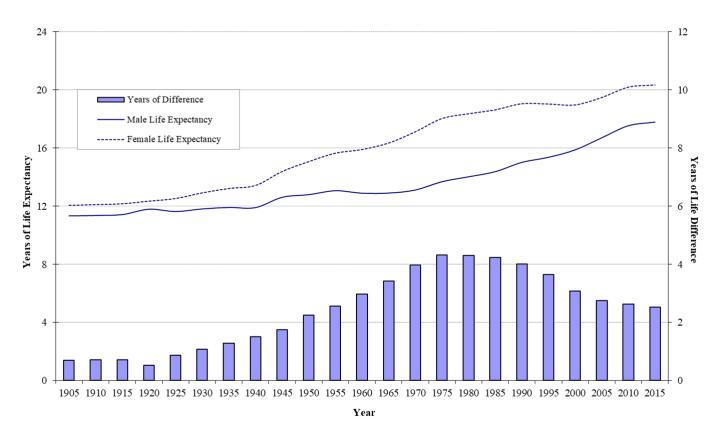
Period Life Expectancy at Birth using the 2019 TR

Period Life Expectancy at Age 65 using the 2019 TR

Projections

Michael Morris

Ultimate Rates of Improvement

- The Board of Trustees sets ultimate rates of improvements

  - By 5 age groups (0 – 14, 15 – 49, 50 – 64, 65 – 84, 85+).

  - By 5 causes of death (cardiovascular, cancer, violence, respiratory, all other).

- Ultimate values are hit in year 25 of the projection, but are graded in at a rapid pace (they are 90% of the way to the ultimate rates in 10 years).

Trustees Assumptions:
Average Annual Rates of Reduction in Central Death Rates by Age Group, Sex, and Cause

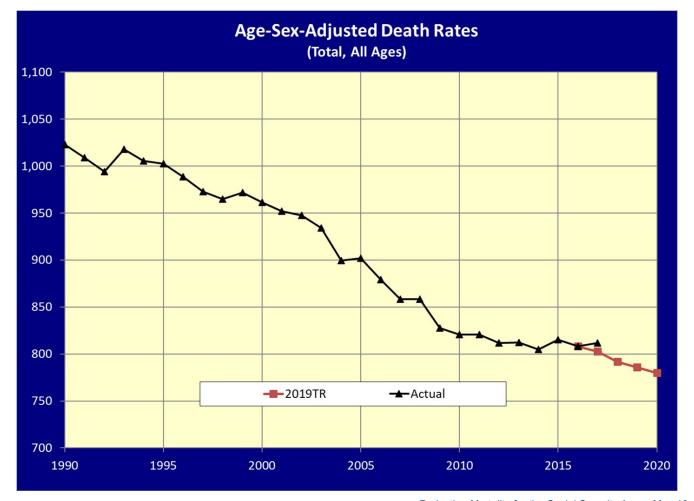|	Historical		Alternative II*		Historical		Alternative II*	
			2018 TR	2019 TR			2018 TR	2019 TR
	1979 to 2016	2006 to 2016	2042 to 2092	2043 to 2093	1979 to 2016	2006 to 2016	2042 to 2092	2043 to 2093
Under Age 15	**Male**				**Female**			
Cardiovascular Disease	2.72	2.54	2.3	2.3	2.61	2.48	2.3	2.3
Cancer	2.21	0.46	1.5	1.5	1.86	1.23	1.5	1.5
Violence	2.73	1.59	1.0	1.0	2.28	1.64	1.0	1.0
Respiratory Disease	2.41	1.21	2.0	2.0	2.46	1.02	2.0	2.0
Other	2.27	2.20	1.7	1.7	2.13	1.98	1.7	1.7
Resulting Total **	2.37	2.00	1.54	1.54	2.17	1.88	1.57	1.57
Ages 15 - 49	**Male**				**Female**			
Cardiovascular Disease	1.90	1.36	1.5	1.5	1.15	0.88	1.5	1.5
Cancer	1.92	2.34	1.5	1.5	1.67	1.74	1.5	1.5
Violence	0.64	-0.40	0.7	0.7	-0.14	-1.21	0.7	0.7
Respiratory Disease	0.77	0.19	0.5	0.5	-0.21	-0.14	0.5	0.5
Other	0.73	1.51	0.8	0.8	-0.32	0.23	0.8	0.8
Resulting Total **	1.09	0.59	0.87	0.86	0.52	0.21	0.94	0.93
Ages 50 - 64	**Male**				**Female**			
Cardiovascular Disease	2.89	0.89	2.2	2.2	2.51	0.80	2.2	2.2
Cancer	1.65	1.43	1.5	1.5	1.41	1.31	1.5	1.5
Violence	-0.22	-2.49	0.5	0.5	-0.90	-3.16	0.5	0.5
Respiratory Disease	0.94	-0.80	0.7	0.7	-0.50	-1.57	0.7	0.7
Other	-0.49	-0.89	0.6	0.6	-0.51	-0.91	0.6	0.6
Resulting Total **	1.51	0.16	1.07	1.06	1.07	0.11	1.06	1.05
Ages 65 - 84	**Male**				**Female**			
Cardiovascular Disease	3.19	2.25	2.2	2.2	2.89	2.56	2.2	2.2
Cancer	1.00	2.06	0.9	0.9	0.13	1.55	0.9	0.9
Violence	0.46	-0.76	0.5	0.5	-0.18	-0.79	0.5	0.5
Respiratory Disease	0.73	1.14	0.3	0.3	-1.68	0.29	0.3	0.3
Other	-0.78	-0.62	0.3	0.3	-1.43	-0.52	0.3	0.3
Resulting Total **	1.57	1.30	0.77	0.78	0.80	1.09	0.72	0.73
Ages 85 and older	**Male**				**Female**			
Cardiovascular Disease	1.75	1.92	1.2	1.2	1.96	2.30	1.2	1.2
Cancer	-0.09	0.97	0.5	0.5	-0.41	0.36	0.5	0.5
Violence	-0.69	-1.21	0.3	0.3	-1.31	-2.13	0.3	0.3
Respiratory Disease	-0.29	1.31	0.2	0.2	-1.45	0.44	0.2	0.2
Other	-2.22	-1.21	0.2	0.2	-3.01	-1.23	0.2	0.2
Resulting Total **	0.36	0.71	0.51	0.52	0.17	0.56	0.49	0.50
Total	**Male**				**Female**			
Cardiovascular Disease	2.60	1.87			2.40	2.19		
Cancer	1.02	1.71			0.56	1.32		
Violence	0.40	-0.92			-0.30	-1.54		
Respiratory Disease	0.43	0.98			-1.35	0.10		
Other	-0.82	-0.60			-1.51	-0.71		
Resulting Total **	1.20	0.87	0.74	0.75	0.65	0.71	0.69	0.70

Starting Death Rates

- Using the last year of death rate data as the starting point for the projections can cause a tremendous amount of variation (from one Trustees Report to the next) as new data becomes available, due to the volatility in mortality data.

- Instead, a starting value is calculated as the base rate for the projections.

- Starting death rates are calculated for 21 age groups, 2 sexes, and 5 causes of death.

- The starting values are calculated to be consistent with the trend inherent in that last 12 years of available data.

Starting Rates of Improvement

- The starting rates of improvement are calculated for 21 age groups, 2 sexes, and 5 causes of death.

- They are assumed to equal the average rates of improvement over the last 10 years of available data.

- These starting rates of improvement are graded in to the Trustees' ultimate rates of improvement.
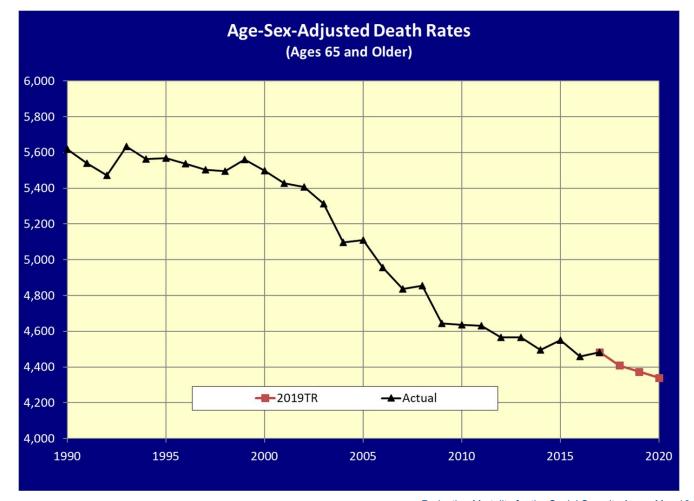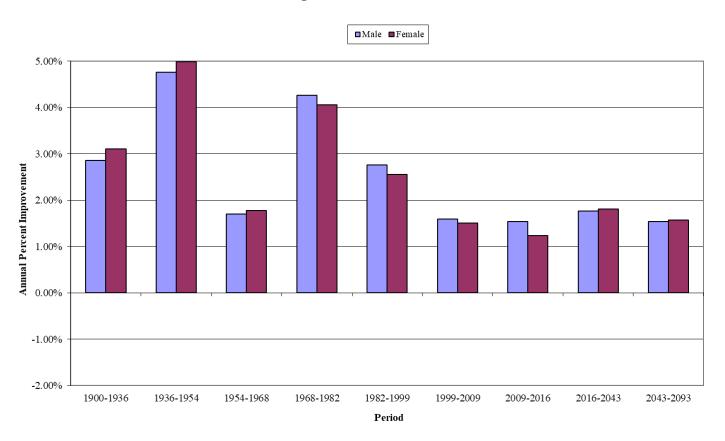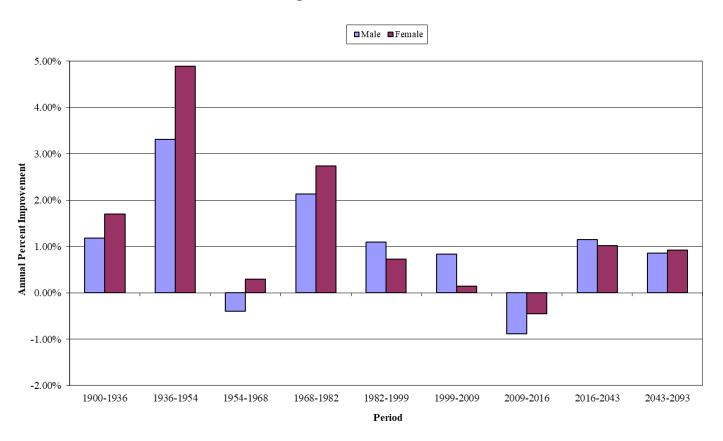
Age-Sex-Adjusted Death Rates
(Ages 65 and Older)

Historical and Alt II Projections of Annual Percentage Reductions in Central Death Rates: Ages 0 - 14 for the 2019 TR
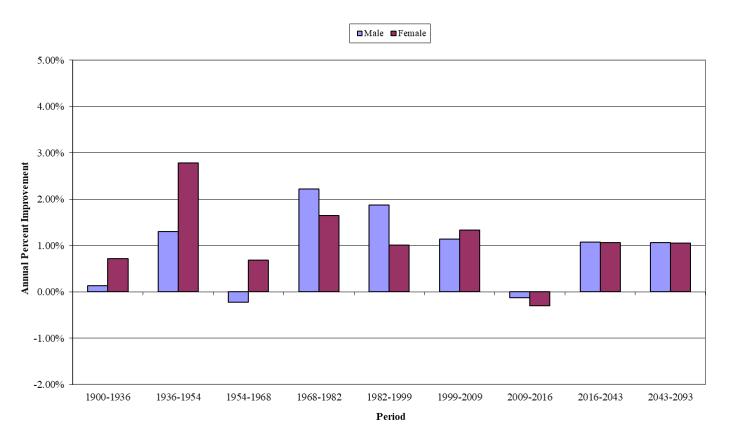
Historical and Alt II Projections of Annual Percentage Reductions in Central Death Rates: Ages 15 - 49 for the 2019 TR
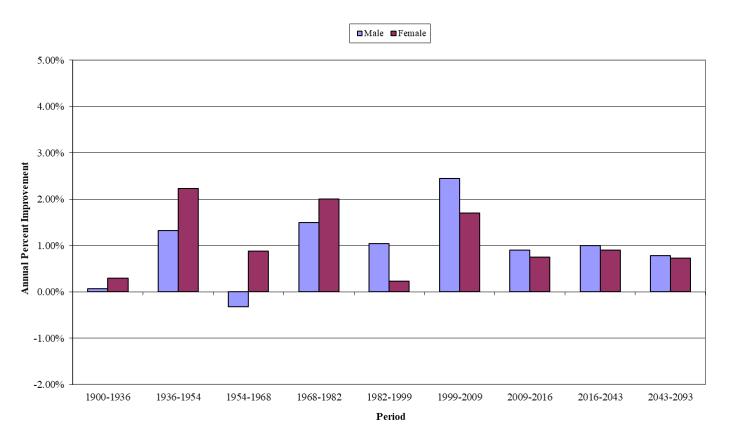
Historical and Alt II Projections of Annual Percentage Reductions in Central Death Rates: Ages 50 - 64 for the 2019 TR
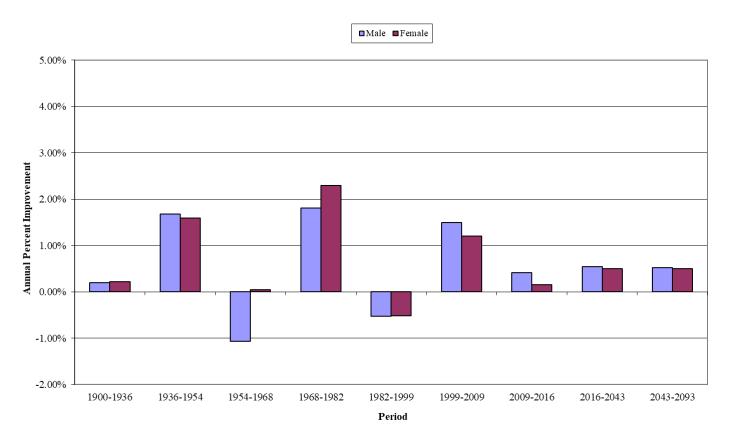
Historical and Alt II Projections of Annual Percentage Reductions in Central Death Rates: Ages 65 - 84 for the 2019 TR

Historical and Alt II Projections of Annual Percentage Reductions in Central Death Rates: Ages 85+ for the 2019 TR

Thank you

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