Preliminary Experience Study and Actuarial Valuation Results

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Office of the State Actuary
"Securing tomorrow's pensions today."

June 30, 2014

Today's Presentation

- Highlights from preliminary experience study and actuarial valuation report
- Budget impact of assumption changes and updated contribution rates
- Managing budget and rate impacts

What Is An Experience Study?

- Review of current assumptions
  - How do they compare with actual experience?
  - Do they need to change?
- Assumptions help us estimate
  - When benefits are paid
  - How much is paid
  - How long they're paid

Why Do We Perform Them?

- Things change
- Ensure assumptions remain reasonable
  - Reasonable assumptions contribute to reasonable funding
- Important part of systematic actuarial funding
- Risk management

How Do We Perform Them?

- They're data driven
  - Over 20 years of experience in some cases
- They also involve professional judgment
  - Past not always the best predictor of future
- Because they involve professional judgment and expertise
  - You hire an actuary to perform studies and certify work
  - You hire an outside actuary to review reasonableness

Why Are The Results Preliminary?

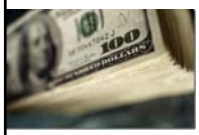
- Concurrent actuarial audit in progress
- The results may change
- Final results available in July

Summary Of Updates To Current Assumptions

- Mortality
  - Changes to reflect lower mortality rates since last study
  - Updates to projected increases in life spans
  - Increases short-term costs
  - Most significant assumption change in this experience study
- Retirement
  - Changes to reflect later retirement; except in WSPRS
  - Decreases short-term costs
- Termination
  - Changes to reflect fewer early career terminations; except TRS
  - Changes to reflect more late career terminations (20+ YOS)
  - Decreases short-term costs (due to TRS changes)

Summary Of Updates To Current Assumptions *(Continued)*

- Disability
  - Minor adjustments made to most plans
- Salary increases
  - Changes to "service based" salary increase assumptions
  - Lowered early career increases and increased/extended salary scale
  - Increases short-term costs
- Miscellaneous assumptions
  - Increases short-term costs
- Supporting data provided in Attachments A-G



National Studies Show People Are Living Longer

- Life expectancy has increased about two years per decade since 1960

Year	Life Expectancy
1900	47.3
1920	54.1
1940	62.9
1960	69.7
1980	73.7
2000	76.8
2010	78.8

Life expectancy from birth. U.S. Census Bureau; all races, all genders.

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8

Long-Term Rates Of Improvement In U.S. Hovered Around 1 Percent

- According to the Society of Actuaries (SOA), long-term averages of U.S. population mortality improvement rates generally hovered around 1 percent
- In 2011, life expectancies recommended by an outside Technical Panel to SSA for their intermediate cost projections equate to a long-term improvement rate of 1.26 percent
- In 2013, the CBO assumed a long-term improvement rate of 1.17 percent in their Long-Term Budget Outlook report
- According to SOA, there's a long-standing pattern of lower mortality rates among retirement program participants compared to the general U.S. population

- Between 1900 and 2009, the age-sex-adjusted death rate in U.S. declined at an average rate of 1.10 percent per year
- From 1982 to 2009, the same death rate declined at an average rate of 0.92 percent per year

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9

Many Factors Will Affect Future Mortality Trends

- According to Office of the Chief Actuary (OCACT) for SSA, factors contributing to generally rapid overall rate of improvement during past century
  - Access to primary medical care
  - Discovery of and general availability of antibiotics and immunizations
  - Clean water supply and waste removal
  - Rapid rate of growth in standard of living
- According to OCACT, each of these developments is expected to make a substantially smaller contribution to future improvement rates
- According to OCACT, future improvements will depend on
  - Medical technology and innovation
  - Treatment and evolution of existing disease; emergence of new disease
  - Changes in amount/type of physical activity; changes in nutrition
  - Prevalence of obesity and cigarette smoking
  - Other factors not summarized here

Several Mortality Projection Scales Available From SOA

- Mortality projections scales
  - Scale AA (0.5 percent long-term improvement rate)
  - Scale BB (1.0 percent long-term improvement rate)
  - MP-2014 (proposed; not final)
- Represent annual rates of improvement (decreases) in future mortality rates
  - Separate rates by gender
- Additional information in Appendix

Observed Mortality Improvement In Washington Retirement Systems Consistent With 100 Percent Of Scale BB

Comparison of Observed Mortality Improvement in Washington to SOA Mortality Projection Scales		
	% of Scale AA	% of Scale BB
1984-2012	109%	78%
1990-2012	152%	97%
1996-2012	204%	127%
2001-2012	143%	136%

For PERS, TRS, SERS, PSERS, LEOFF, and WSPRS combined.

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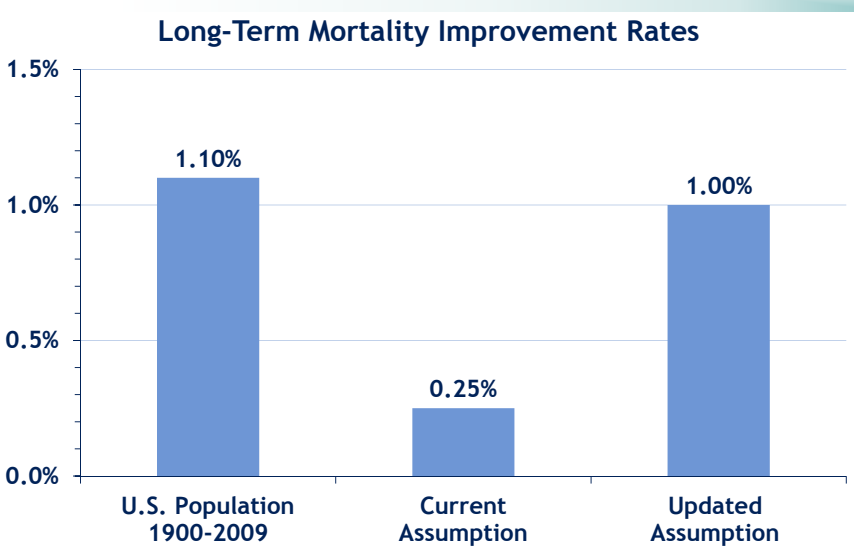
Current Assumption Less Than One Quarter Of Observed Long-Term Improvement in U.S.



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Life Expectancies For A 65-Year Old In 2034 Increase Over Two Years Under Updated Assumption*

In 2014	50% of Scale AA (Current Assumption)	100% of Scale AA	100% of Scale BB (Updated Assumption)
Male	83.1	83.7	84.1
Female	85.4	85.7	86.4
In 2024			
Male	83.5	84.4	85.1
Female	85.6	86.1	87.3
In 2034			
Male	83.9	85.1	86.2
Female	85.8	86.6	88.2

**All based on RP-2000 combined mortality table with mortality projection to the year indicated above. No projection of mortality improvement beyond the year indicated above.*

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Recap On Mortality

- Long-term rates of improvement in U.S hovered around 1 percent
- Current assumption for Washington state retirement system is less than one-quarter of long-term observed improvement rates
- Updated assumption is consistent with long-term mortality experience in U.S. and Washington state
  - 100 percent of Scale BB
- Continue to monitor improvement rates in future experience studies

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Next Up

- Preliminary valuation results
  - June 30, 2013
  - Includes all updated demographic assumptions from experience study (ExpStudy)
  - Lower expected rate of investment return (ExpROR); 7.8 percent
- Budget impacts
  - Include results from latest actuarial valuation plus all updated assumptions

Measuring Plan Health

- Has everything happened as planned?
- Are we on track with our systematic actuarial funding plan?
- Two key measurements
  - Funded status
  - Unfunded Actuarial Accrued Liability (UAAL)

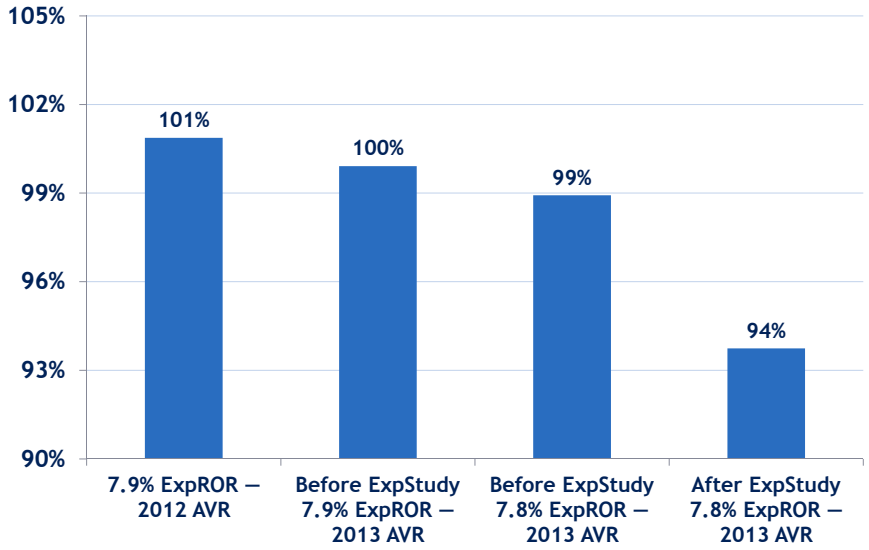
Funded Status

- Comparison of plan assets to today's value of earned pensions
  - Point-in-time measurement
- A funded status of at least 100 percent means a plan has at least $1 in assets for each $1 of earned pension liability
  - On track with systematic actuarial funding plan

Unfunded Actuarial Accrued Liability

- Occurs when a plan does not have sufficient assets to cover earned pension liabilities
  - Funded status less than 100 percent
- Off track with systematic actuarial funding plan
- Requires additional contributions to get back on track
  - Normal cost plus UAAL contributions

Funded Status – All Plans Combined



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20

Funded Status – All Plans Combined *(Continued)*

Funded Status at June 30			
(Dollars in Millions)		2013	2012
All Systems			
a.	Accrued Liability	$69,828	$62,578
b.	Market Value of Assets	62,213	56,753
c.	Deferred Gains/(Losses)	(3,245)	(6,369)
d.	Actuarial Value of Assets (b-c)	65,458	63,122
e.	Unfunded Liability (a-d)	$4,370	($544)
f.	Funded Ratio (d/a)	94%	101%

Note: Totals may not agree due to rounding.

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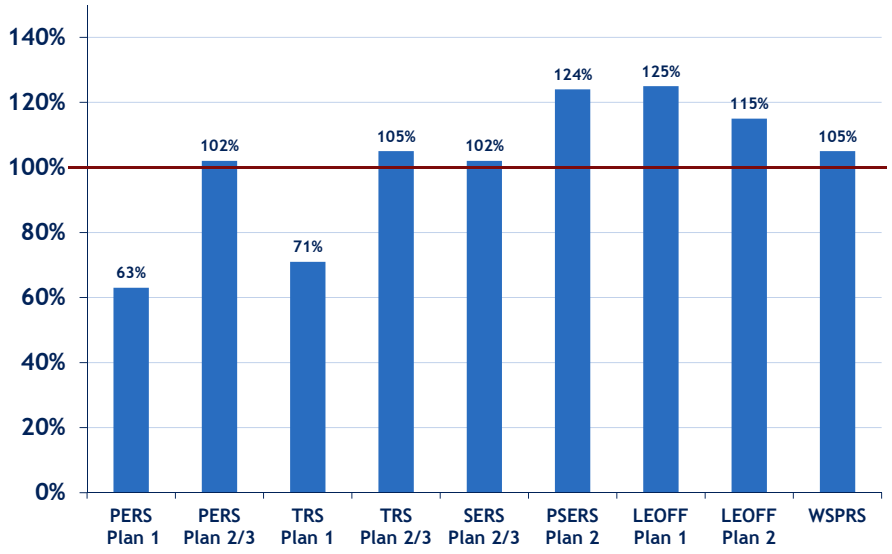
Funded Status Above 100 Percent For All Open Plans



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Funded Status By Plan At June 30, 2013

Funded Status on an Actuarial Value Basis

(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	$12,884	$23,798	$9,449	$8,016	$3,273	$180	$4,410	$6,859	$959	$69,828
Valuation Assets	$8,053	$24,335	$6,717	$8,406	$3,335	$224	$5,516	$7,862	$1,009	$65,458
Unfunded Liability	$4,831	($537)	$2,732	($390)	($62)	($44)	($1,107)	($1,003)	($50)	$4,370
Funded Ratio										
2013*	**63%**	**102%**	**71%**	**105%**	**102%**	**124%**	**125%**	**115%**	**105%**	**94%**
2012	69%	111%	79%	114%	110%	134%	135%	119%	114%	101%
2011*	71%	112%	81%	113%	110%	132%	135%	119%	115%	101%
2010*	74%	113%	84%	116%	113%	129%	127%	119%	118%	102%
2009*	70%	116%	75%	118%	116%	128%	125%	128%	119%	99%
2008*	71%	119%	77%	125%	121%	127%	128%	133%	121%	100%
2007*	71%	120%	76%	130%	126%	120%	123%	129%	118%	99%
2006*	74%	121%	80%	133%	125%	99%	117%	116%	114%	100%
2005*	74%	127%	80%	134%	122%	N/A	114%	114%	113%	99%
2004	81%	134%	88%	153%	137%	N/A	109%	117%	118%	105%
2003	82%	142%	89%	155%	138%	N/A	112%	125%	123%	107%
2002	92%	158%	98%	182%	169%	N/A	119%	137%	135%	118%
2001*	97%	179%	100%	197%	197%	N/A	129%	154%	147%	126%
2000*	98%	190%	100%	196%	170%	N/A	136%	161%	152%	131%

**Assumption or method change.*

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Funded Status By Plan With Different Interest Rate Assumption

Funded Status at a 1% Lower Interest Rate Assumption

(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	$14,012	$27,818	$10,272	$9,523	$3,806	$226	$4,844	$8,212	$1,105	$79,818
Valuation Assets	$8,053	$24,335	$6,717	$8,406	$3,335	$224	$5,516	$7,862	$1,009	$65,458
Unfunded Liability	$5,959	$3,484	$3,555	$1,117	$471	$2	($673)	$349	$96	$14,360
Funded Ratio										
2013	**57%**	**87%**	**65%**	**88%**	**88%**	**99%**	**114%**	**96%**	**91%**	**82%**
2012	64%	96%	73%	97%	95%	108%	124%	100%	100%	89%

Funded Status at a 1% Higher Interest Rate Assumption

(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	$11,914	$20,600	$8,741	$6,838	$2,845	$147	$4,039	$5,808	$843	$61,775
Valuation Assets	$8,053	$24,335	$6,717	$8,406	$3,335	$224	$5,516	$7,862	$1,009	$65,458
Unfunded Liability	$3,861	($3,735)	$2,023	($1,568)	($490)	($78)	($1,477)	($2,054)	($167)	($3,683)
Funded Ratio										
2013	**68%**	**118%**	**77%**	**123%**	**117%**	**153%**	**137%**	**135%**	**120%**	**106%**
2012	74%	128%	85%	133%	126%	162%	146%	140%	129%	113%

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24

PERS 1 And TRS 1 UAAL At June 30, 2013

Funded Status on an Actuarial Value Basis

(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plans 2/3	Plan 1	Plans 2/3	Plans 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	$12,884	$23,798	$9,449	$8,016	$3,273	$180	$4,410	$6,859	$959	$69,828
Valuation Assets	$8,053	$24,335	$6,717	$8,406	$3,335	$224	$5,516	$7,862	$1,009	$65,458
Unfunded Liability	$4,831	($537)	$2,732	($390)	($62)	($44)	($1,107)	($1,003)	($50)	$4,370

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Plan For Getting PERS 1 And TRS 1 Back On Track

- New funding method adopted in 2009
- Requires higher employer UAAL contribution rates
- Phasing in higher UAAL rate requirements
  - Full requirements begin in 2015
- Expected full funding dates (before assumption changes)
  - 2027 in PERS 1; 2026 in TRS 1
  - Assumes required contributions are made and actuarial assumptions are realized
  - Full funding will occur sooner/later under optimistic/pessimistic outcomes

Up Next: Preliminary Budget Impacts

- Concurrent outside audit in progress
  - Results may change
- 2015-17 and 2017-19 Budget impacts only
  - No long-term impacts provided
  - Excludes LEOFF 2
- Assumptions updated again in six years
- Actual costs based on actual benefits paid and actual investment returns on contributions made

Preliminary 2015-17 And 2017-19 Budget Impacts

Increase Above 2013-15 Current Law Budget*				
	Before ExpStudy 7.9% ExpROR	7.8% ExpROR Only	ExpStudy Changes Only	After ExpStudy 7.8% ExpROR
(Dollars in millions)	A	B	C	A+B+C
2015-2017				
General Fund	$125	$50	$307	$482
Non-General Fund	$26	$29	$141	$196
Total State	$150	$79	$449	$678
Local Government	$108	$71	$377	$556
Total Employer	$258	$150	$826	$1,233
Total Employee	$4	$75	$328	$408
2017-2019				
General Fund	$138	$54	$337	$529
Non-General Fund	$28	$31	$152	$211
Total State	$165	$85	$489	$740
Local Government	$118	$77	$410	$604
Total Employer	$283	$163	$899	$1,344
Total Employee	$5	$83	$362	$449

**Excludes LEOFF 2. Budget impacts reflect difference between current contribution rates and the rates from the preliminary 2013 AVR only.*
Totals may not agree due to rounding.

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28

Preliminary 2015-17 Employer Contribution Rates*

Total Employer Contribution Rates				
	Current	Before ExpStudy 7.9% ExpROR	Before ExpStudy 7.8% ExpROR	After ExpStudy 7.8% ExpROR
PERS	9.03%	9.47%	9.95%	12.29%
TRS	10.21%	11.60%	11.92%	14.47%
SERS 2/3	9.64%	10.26%	10.75%	12.88%
PSERS 2	10.36%	10.40%	10.72%	12.07%
LEOFF 1	0.00%	0.00%	0.00%	0.00%
WSPRS 1/2	7.91%	7.68%	7.84%	8.79%

**Excludes current administrative expense rate of 0.18%.*

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29

Preliminary 2015-17 Member Contribution Rates

Member Contribution Rates				
	Current	Before ExpStudy 7.9% ExpROR	Before ExpStudy 7.8% ExpROR	After ExpStudy 7.8% ExpROR
PERS 2	4.92%	4.95%	5.33%	7.00%
TRS 2	4.96%	4.93%	5.25%	6.79%
SERS 2	4.64%	4.85%	5.24%	6.70%
PSERS 2	6.36%	5.99%	6.21%	6.89%
LEOFF 1	0.00%	0.00%	0.00%	0.00%
WSPRS 1/2*	6.59%	6.36%	6.52%	7.19%

**WSPRS maximum employee rate is 7.19%*

Managing Budget And Rate Impacts

- PFC and Legislature may consider short-term funding policy changes to manage the short-term impacts of assumption changes
- Balancing act
  - Pay now or pay more later
  - Finding the sweet spot; affordable now and later
- Options to manage budget and rate impacts
  - Recognize full cost and rate increases from assumption changes now; or
  - Spread cost of assumption changes over more than one biennium

Recent Phase-Ins

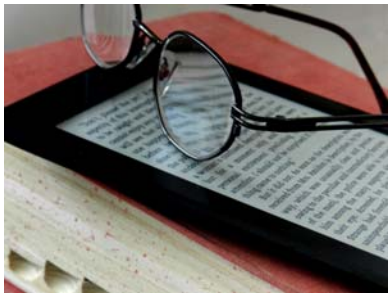
- 2005-09 rate increases (C 370, L 2005)
  - Phased in rate increases over four years
  - All expected costs contained over the phase-in period
- New Plan 1 funding method adopted in 2009 (C 591, L 2009)
  - Phased in higher minimum rates over six years
- Lower rate of return assumptions (C 7, L 2012)
  - 7.9 percent assumed ROR for 2013-15
  - 7.8 percent assumed ROR for 2015-17
  - 7.7 percent assumed ROR for 2017-19

Additional References

- Supporting experience study data
  - Attachments A-F
- Itemized impact of assumption changes
  - Attachment G
- Appendix
- Staff at OSA
- Full experience study report and AVR available this fall

Appendix

- Information on mortality improvement scales



Mortality Projection Scales

- Several projection scales available from SOA
  - Scale AA
  - Scale BB
  - MP-2014 (proposed; not final)
- Represent rates of improvement (decreases) in future mortality rates
  - Separate rates by gender
- Vary by dimension/format of scale and experience data used to develop scale
  - 1D — age only
  - 2D — age and year of birth
- Current assumption is 50 percent of Scale AA

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Development/History Of Current Assumption

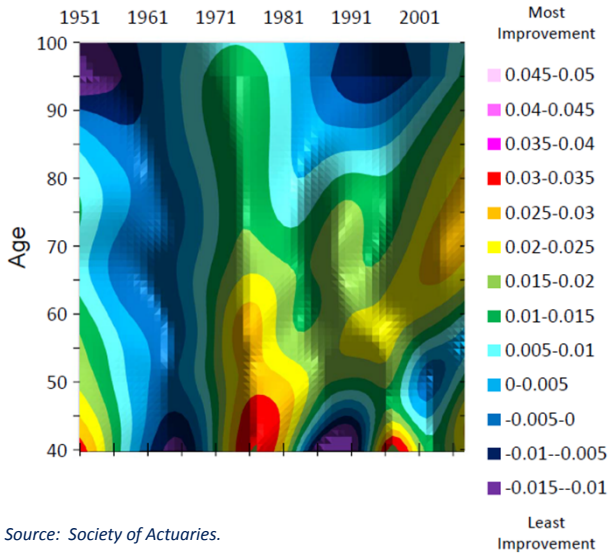
- Not a new subject for Washington State
- Scale AA included in 2001-2006 Experience Study
  - Fifty percent of Scale AA proposed in 2008
  - Adopted rates for 2009-2011 excluded projected improvements in mortality
- Scale AA included in 2010 rate calculations for 2011-2013
  - Adopted rates for 2011-2013 included 50 percent of Scale AA
- Scale AA reviewed in 2007-2012 Experience Study
  - Rate calculations for 2015-2017 will include an updated assumption from the most recent data/analysis available

Scale AA

- Released by SOA in 1995
- Developed using SSA and Civil Service Retirement System data from 1977 to 1993
- Assumed rates of improvement
  - Minimum rate of improvement of 0.5 percent for ages under 85
  - Graded down to 0.1 percent at age 100
  - No improvement at ages over 100
- In late 2009, Retirement Plans Experience Committee (RPEC) of SOA found

  "… a noticeable degree of mismatch between the Scale AA rates and actual mortality experience for ages under 50, and the Scale AA rates were lower than actual mortality improvement rates for most ages over 55."
- Analysis also showed cohort effects
  - Improvements varying by generations

Observed U.S. Mortality Improvement (Heat Map) - Males



Source: Society of Actuaries.

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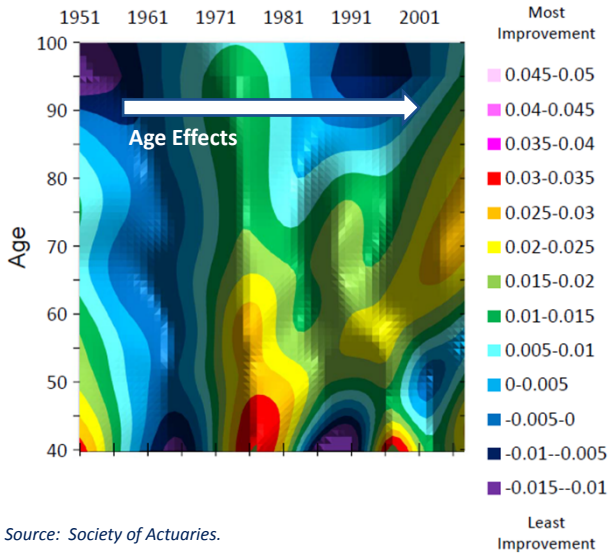
38

Observed U.S. Mortality Improvement (Heat Map) - Males



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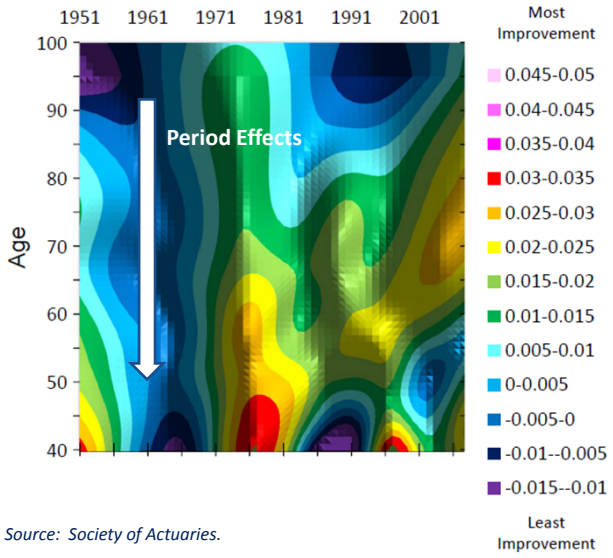
Observed U.S. Mortality Improvement (Heat Map) - Males



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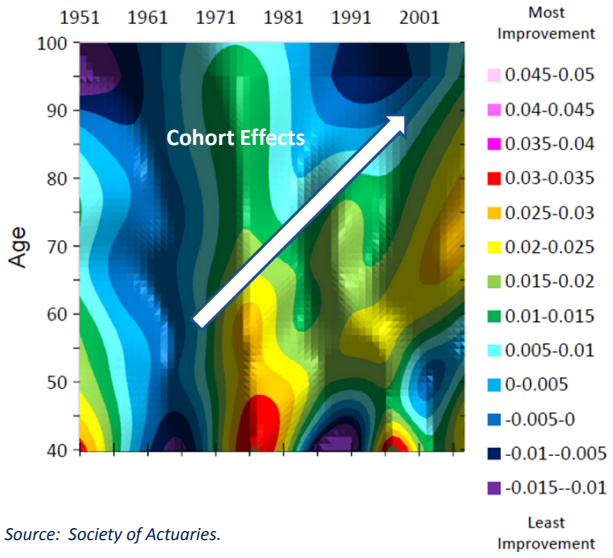
Observed U.S. Mortality Improvement (Heat Map) - Males



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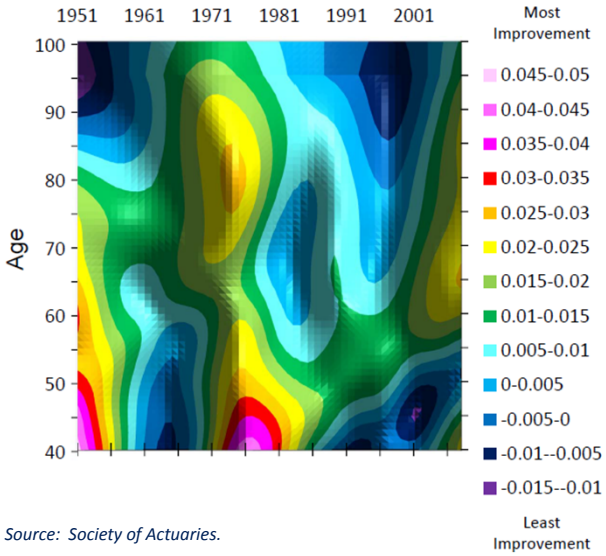
Observed U.S. Mortality Improvement (Heat Map) - Females



Source: Society of Actuaries.

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42

Scale BB

- Interim improvement scale released by SOA in 2012
- Created to replace Scale AA
- Prepare actuaries for upcoming 2D improvement scale
- Developed using SSA data from 1950 to 2007
- Assumed rates of improvement for 2D table
  - Long-term rate of 1 percent for all ages through 90
  - Decreasingly linearly from 90 to 120
  - Convergence periods of up to 20 years for age/period effects and ten years for cohort effects
- 2D table converted to an approximate 1D table
- Updated assumption from this experience study

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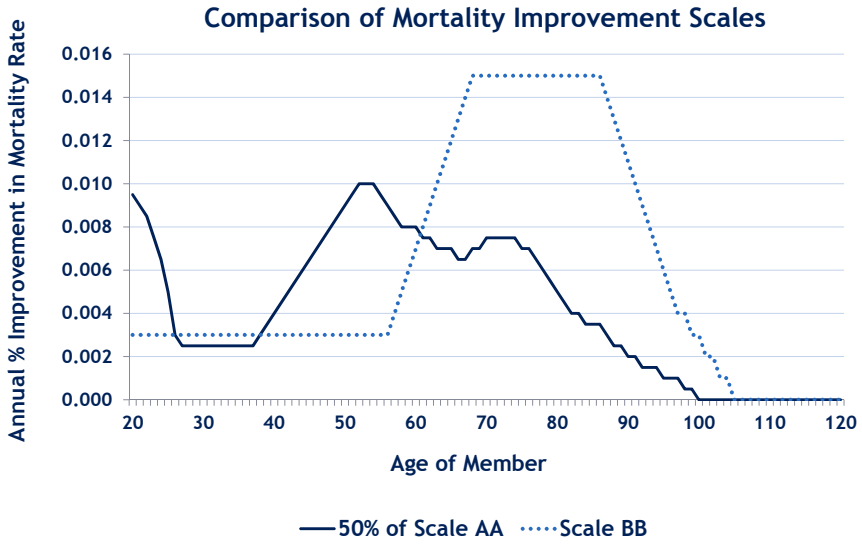
Comparison Of Current Assumption To Updated Assumption – Males



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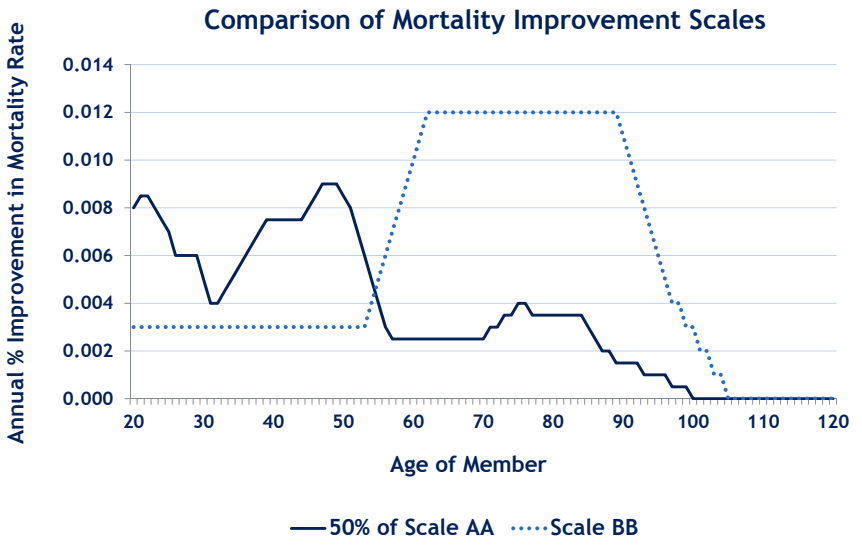
Comparison Of Current Assumption To Updated Assumption – Females



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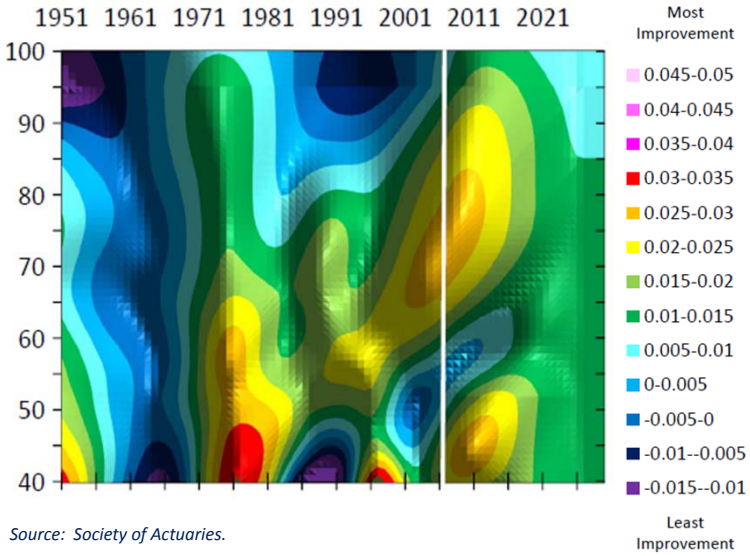
Scale MP-2014

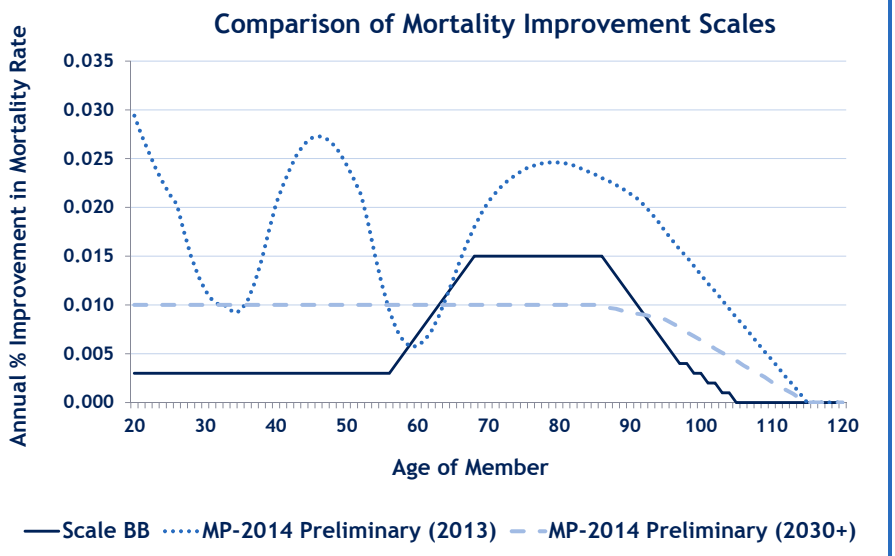
- Proposed 2D scale to replace Scale BB
  - Improvement rates by age and year of birth
- Not yet final; adoption expected later this year
- Theoretical framework patterned after the mortality projections used to develop Scale BB-2D
  - Short-term mortality improvement based on recent experience;
  - Long-term improvement rates based on expert opinion; and
  - Short-term improvement rates blend smoothly into long-term assumption rates over an appropriate transition period

MP-2014 Heat Map – Males



Source: Society of Actuaries.

Comparison Of Updated Assumption To Scale MP-2014 – Males



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48