

Long-Term Care Insurance Mortality and Lapse Study

Developed by the Long-Term Care Valuation Work Group
of the American Academy of Actuaries
and the Society of Actuaries Research Institute

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Long-Term Care Insurance (LTC) Mortality and Lapse Study

- [Study Released November 2021](#)
- Developed by the Long-Term Care Valuation Work Group of the American Academy of Actuaries and the Society of Actuaries Research Institute



Requests of the LTC Valuation Work Group

- Develop a replacement mortality table for LTC active life reserves
 - Based on the 2012 Individual Annuity Mortality Table
 - Recommend a margin for conservatism
- Develop a replacement lapse table
 - Recommend a margin for conservatism
- Consider developing tables for valuation on total lives basis as well as active lives basis



Executive Summary

- Developed valuation mortality table
 - Mortality is select and ultimate; all previous valuation mortality tables have been aggregate
 - Optional factors are provided for marital status and risk class
 - Mortality tables are provided for both total lives and active lives (off-claim) exposures
 - Margin for valuation mortality tables is included
 - Tables are included in the report as an Excel file



Executive Summary

- Developed valuation lapse table
 - Valuation lapse tables are developed separately for individual and group coverages; current valuation lapse tables vary for group coverage only for durations 5+ (3% v 2%)
 - Optional factors are provided for marital status and risk class for individual coverages only
 - Lapse tables are provided for both total lives and active lives (off-claim) exposures
 - Margin for valuation lapse tables is included



Recommended Mortality Tables (Total Lives)



Death Counts (Total Lives)

By Sex, Risk Class, Attained Age, and Marital Status

Attained Age	Female: Preferred Risk			Female: Standard Risk			Male: Preferred Risk			Male: Standard Risk		
	Married	Single	Total	Married	Single	Total	Married	Single	Total	Married	Single	Total
Under 60	217	113	330	373	184	557	180	69	249	384	113	497
60-64	393	194	587	708	357	1,065	407	106	513	887	192	1,079
65-69	670	346	1,016	1,329	839	2,168	795	177	972	1,720	425	2,145
70-74	1,022	716	1,738	2,402	1,670	4,072	1,375	370	1,745	3,331	934	4,265
75	270	252	522	650	520	1,170	414	115	529	938	293	1,231
76	266	288	554	717	562	1,279	454	148	602	1,112	332	1,444
77	272	296	568	786	675	1,461	515	132	647	1,167	342	1,509
78	243	304	547	868	779	1,647	485	190	675	1,261	460	1,721
79	330	415	745	937	904	1,841	527	163	690	1,436	520	1,956
80	304	442	746	951	999	1,950	527	186	713	1,426	594	2,020
81	313	459	772	984	1,129	2,113	542	169	711	1,541	652	2,193
82	338	509	847	999	1,224	2,223	527	218	745	1,534	666	2,200
83	337	591	928	1,008	1,290	2,298	546	228	774	1,557	748	2,305
84	307	602	909	925	1,345	2,270	526	208	734	1,549	762	2,311
85	344	694	1,038	954	1,395	2,349	515	241	756	1,451	735	2,186
86	316	757	1,073	868	1,506	2,374	487	276	763	1,460	756	2,216
87	308	727	1,035	791	1,520	2,311	434	254	688	1,302	799	2,101
88	258	803	1,061	725	1,452	2,177	397	208	605	1,184	733	1,917
89	248	745	993	624	1,362	1,986	356	198	554	964	589	1,553
90-94	590	2,605	3,195	1,543	4,483	6,026	943	625	1,568	2,467	1,911	4,378
95 and over	112	914	1,026	266	1,542	1,808	199	171	370	360	463	823
Total	7,458	12,772	20,230	19,408	25,737	45,145	11,151	4,452	15,603	29,031	13,019	42,050



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Recommended Marital Status Adjustment Factors for Mortality Table (Total Lives)

Representative rates shown

		Married Adjustment Factors																
Issue Age		Duration												Ultimate	Attained Age			
		1	2	3	4	5	*	*	*	26	27	28	29			30		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
45	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	75			
46	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	76			
47	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	77			
48	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	78			
49	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	79			
50	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	80			
51	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	81			
52	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	82			
53	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	83			
54	0.90	0.90	0.90	0.90	0.90	*	*	*	0.95	0.96	0.97	0.98	0.99	1.00	84			
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
80	0.95	0.95	0.95	0.95	0.95	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	110			
81	0.96	0.96	0.96	0.96	0.96	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	111			
82	0.96	0.96	0.96	0.96	0.96	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	112			
83	0.97	0.97	0.97	0.97	0.97	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	113			
84	0.97	0.97	0.97	0.98	0.98	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	114			
85	0.98	0.98	0.98	0.98	0.99	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	115			
86	0.98	0.98	0.98	0.99	0.99	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	116			
87	0.99	0.99	0.99	0.99	0.99	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	117			
88	0.99	0.99	0.99	0.99	0.99	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	118			
89	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	119			
90	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	120			

		Not Married Adjustment Factors																
Issue Age		Duration												Ultimate	Attained Age			
		1	2	3	4	5	*	*	*	26	27	28	29			30		
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
45	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	75			
46	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	76			
47	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	77			
48	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	78			
49	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	79			
50	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	80			
51	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	81			
52	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	82			
53	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	83			
54	1.28	1.28	1.28	1.28	1.28	*	*	*	1.14	1.11	1.08	1.06	1.03	1.00	84			
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
80	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	110			
81	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	111			
82	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	112			
83	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	113			
84	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	114			
85	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	115			
86	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	116			
87	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	117			
88	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	118			
89	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	119			
90	1.00	1.00	1.00	1.00	1.00	*	*	*	1.00	1.00	1.00	1.00	1.00	1.00	120			

Recommended Underwriting Class Adjustment Factors for Mortality Table (Total Lives)

Representative rates shown

Issue Age	Preferred Underwriting Class Adjustment Factors													Att Age	
	Duration														
	1	2	3	4	5	.	.	.	26	27	28	29	30	Ultimate	
.
45	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	75
46	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	76
47	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	77
48	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	78
49	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	79
50	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	80
51	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	81
52	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	82
53	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	83
54	0.80	0.80	0.80	0.80	0.80	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	84
.
.
80	0.75	0.78	0.80	0.83	0.85	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	110
81	0.75	0.78	0.81	0.83	0.86	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	111
82	0.75	0.78	0.81	0.84	0.88	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	112
83	0.75	0.79	0.82	0.86	0.89	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	113
84	0.75	0.79	0.83	0.88	0.92	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	114
85	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	115
86	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	116
87	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	117
88	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	118
89	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	119
90	0.75	0.80	0.85	0.90	0.95	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	120

Issue Age	Standard Underwriting Class Adjustment Factors													Att Age	
	Duration														
	1	2	3	4	5	.	.	.	26	27	28	29	30	Ultimate	
.
45	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	75
46	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	76
47	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	77
48	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	78
49	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	79
50	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	80
51	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	81
52	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	82
53	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	83
54	1.15	1.15	1.15	1.15	1.15	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	84
.
.
80	1.10	1.09	1.08	1.07	1.06	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	110
81	1.10	1.09	1.08	1.07	1.06	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	111
82	1.10	1.09	1.08	1.06	1.05	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	112
83	1.10	1.09	1.07	1.06	1.04	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	113
84	1.10	1.08	1.07	1.05	1.03	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	114
85	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	115
86	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	116
87	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	117
88	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	118
89	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	119
90	1.10	1.08	1.06	1.04	1.02	.	.	.	1.00	1.00	1.00	1.00	1.00	1.00	120



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Recommended Lapse Tables

(Total Lives and Active Lives)



Recommended Individual Lapse Table— Total Lives (With Margins)

Policy Year	Issue Age Group						Marital Status Adjustment Factor			Underwriting Class Adjustment Factor		
	Under 55	55-59	60-64	65-69	70-74	75 & Over	Married	Single	Unknown	Preferred	Standard	Sub-standard
1	5.2%	2.9%	3.9%	3.7%	4.6%	6.6%	0.89	1.47	1.00	1.04	0.88	1.16
2	4.5%	2.6%	2.5%	2.6%	3.2%	4.8%	0.88	1.49	1.00	1.07	0.84	1.14
3	3.9%	2.2%	2.0%	2.1%	2.6%	4.1%	0.87	1.52	1.00	1.08	0.82	1.12
4	3.4%	2.0%	1.6%	1.9%	2.3%	3.6%	0.86	1.53	1.00	1.09	0.82	1.11
5	2.9%	1.7%	1.4%	1.7%	2.1%	3.2%	0.85	1.54	1.00	1.09	0.82	1.09
6	2.6%	1.5%	1.3%	1.5%	2.0%	3.0%	0.84	1.55	1.00	1.09	0.84	1.07
7	2.2%	1.4%	1.2%	1.4%	1.8%	2.8%	0.83	1.55	1.00	1.07	0.88	1.05
8	1.9%	1.2%	1.1%	1.4%	1.7%	2.6%	0.82	1.54	1.00	1.05	0.92	1.03
9	1.6%	1.0%	1.0%	1.3%	1.6%	2.6%	0.82	1.53	1.00	1.03	0.98	1.02
10	1.4%	0.9%	0.9%	1.2%	1.5%	2.4%	0.81	1.52	1.00	0.99	1.06	1.00
11	1.3%	0.8%	0.9%	1.2%	1.4%	2.3%	0.81	1.50	1.00	0.95	1.14	0.98
12	1.1%	0.7%	0.9%	1.1%	1.4%	2.2%	0.80	1.48	1.00	0.95	1.14	0.98
13	0.9%	0.6%	0.8%	1.1%	1.4%	2.1%	0.80	1.45	1.00	0.95	1.14	0.98
14	0.8%	0.5%	0.8%	1.0%	1.3%	2.0%	0.79	1.41	1.00	0.95	1.14	0.98
15	0.7%	0.5%	0.8%	1.0%	1.3%	2.0%	0.79	1.37	1.00	0.95	1.14	0.98
16 & Over	0.6%	0.4%	0.7%	0.9%	1.2%	2.0%	0.79	1.33	1.00	0.95	1.14	0.98

Recommended Group Lapse Table—Total Lives (With Margins)

Policy Year	Issue Age Group						
	Under 35	35-39	40-44	45-49	50-54	55-59	60 & Over
1	19.4%	13.8%	11.2%	9.0%	7.8%	8.0%	6.9%
2	16.7%	11.4%	9.4%	7.6%	6.5%	6.5%	5.6%
3	14.2%	9.5%	7.8%	6.4%	5.4%	5.2%	4.5%
4	12.0%	7.9%	6.5%	5.4%	4.5%	4.2%	3.6%
5	9.9%	6.5%	5.5%	4.5%	3.8%	3.4%	2.9%
6	8.1%	5.4%	4.6%	3.8%	3.1%	2.8%	2.3%
7	6.5%	4.5%	3.8%	3.2%	2.6%	2.2%	1.9%
8	5.2%	3.7%	3.2%	2.7%	2.2%	1.8%	1.5%
9	4.0%	3.1%	2.7%	2.3%	1.8%	1.5%	1.2%
10	3.1%	2.5%	2.2%	1.9%	1.5%	1.2%	1.0%
11	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.8%
12	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.8%
13	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.8%
14	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.8%
15	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.8%
16 & Over	1.9%	1.7%	1.5%	1.4%	1.1%	0.8%	0.6%



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Recommended Individual Lapse Table— Active Lives (No Margins)

Policy Year	Issue Age Group						Marital Status Adjustment Factor			Underwriting Class Adjustment Factor		
	Under 55	55-59	60-64	65-69	70-74	75 & Over	Married	Single	Unknown	Preferred	Standard	Sub-standard
1	6.1%	3.4%	4.6%	4.4%	5.4%	7.8%	0.89	1.47	1.00	1.04	0.88	1.16
2	5.3%	3.0%	2.9%	3.1%	3.8%	5.7%	0.88	1.49	1.00	1.07	0.84	1.14
3	4.6%	2.6%	2.3%	2.5%	3.1%	4.8%	0.87	1.52	1.00	1.08	0.82	1.12
4	4.0%	2.3%	1.9%	2.2%	2.7%	4.2%	0.86	1.53	1.00	1.09	0.82	1.11
5	3.4%	2.0%	1.7%	2.0%	2.5%	3.8%	0.85	1.54	1.00	1.09	0.82	1.09
6	3.0%	1.8%	1.5%	1.8%	2.3%	3.5%	0.84	1.55	1.00	1.09	0.84	1.07
7	2.6%	1.6%	1.4%	1.7%	2.1%	3.3%	0.83	1.55	1.00	1.07	0.88	1.05
8	2.2%	1.4%	1.3%	1.6%	2.0%	3.1%	0.82	1.54	1.00	1.05	0.92	1.03
9	1.9%	1.2%	1.2%	1.5%	1.9%	3.0%	0.82	1.53	1.00	1.03	0.98	1.02
10	1.7%	1.1%	1.1%	1.4%	1.8%	2.8%	0.81	1.52	1.00	0.99	1.06	1.00
11	1.5%	0.9%	1.0%	1.4%	1.7%	2.7%	0.81	1.50	1.00	0.95	1.14	0.98
12	1.3%	0.8%	1.0%	1.3%	1.6%	2.6%	0.80	1.48	1.00	0.95	1.14	0.98
13	1.1%	0.7%	0.9%	1.3%	1.6%	2.5%	0.80	1.45	1.00	0.95	1.14	0.98
14	0.9%	0.6%	0.9%	1.2%	1.5%	2.4%	0.79	1.41	1.00	0.95	1.14	0.98
15	0.8%	0.6%	0.9%	1.2%	1.5%	2.4%	0.79	1.37	1.00	0.95	1.14	0.98
16 & Over	0.7%	0.5%	0.8%	1.1%	1.4%	2.3%	0.79	1.33	1.00	0.95	1.14	0.98



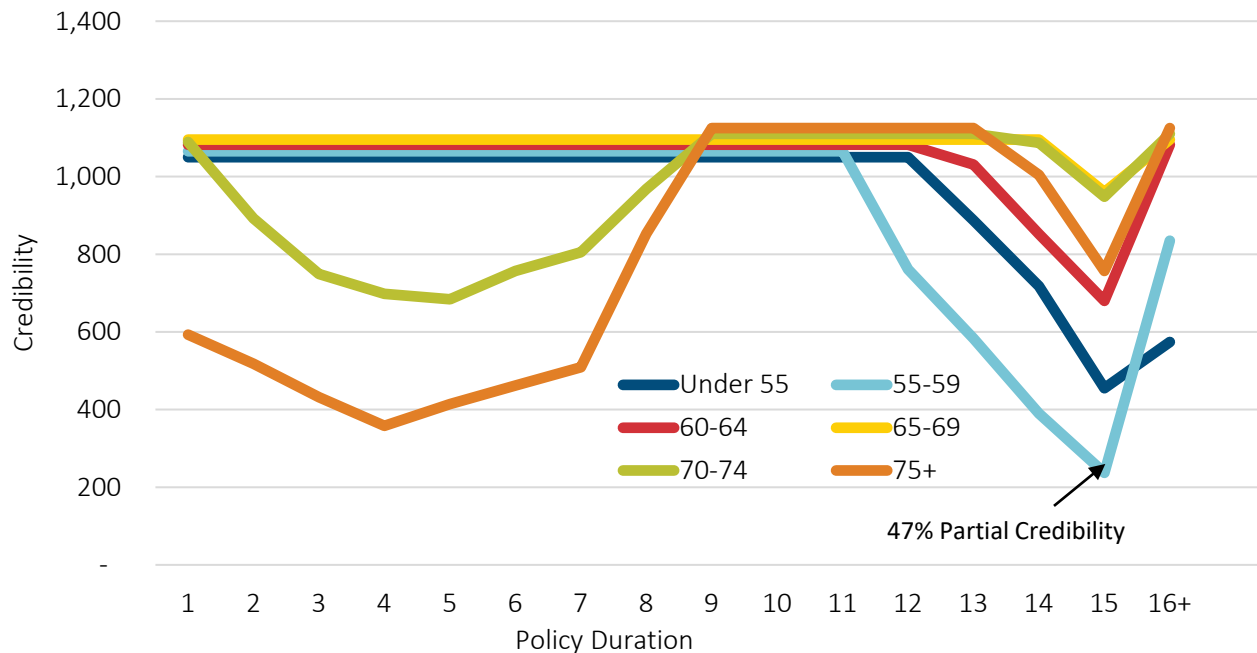
Recommended Group Lapse Table—Active Lives (With Margins)

Issue Age Group							
Policy Year	Under 35	35-39	40-44	45-49	50-54	55-59	60 & Over
1	19.4%	13.8%	11.2%	9.0%	7.8%	8.0%	6.9%
2	16.7%	11.5%	9.4%	7.6%	6.5%	6.5%	5.6%
3	14.2%	9.5%	7.8%	6.4%	5.4%	5.2%	4.5%
4	12.0%	7.9%	6.5%	5.4%	4.5%	4.3%	3.7%
5	9.9%	6.5%	5.5%	4.5%	3.8%	3.5%	3.0%
6	8.1%	5.4%	4.6%	3.8%	3.2%	2.8%	2.5%
7	6.5%	4.5%	3.8%	3.2%	2.6%	2.3%	2.0%
8	5.2%	3.7%	3.2%	2.7%	2.2%	1.9%	1.7%
9	4.0%	3.1%	2.7%	2.3%	1.8%	1.5%	1.4%
10	3.1%	2.6%	2.2%	1.9%	1.5%	1.3%	1.1%
11	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.9%
12	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.9%
13	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.9%
14	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.9%
15	2.4%	2.1%	1.9%	1.6%	1.3%	1.0%	0.9%
16 & Over	1.9%	1.8%	1.5%	1.4%	1.1%	0.8%	0.7%



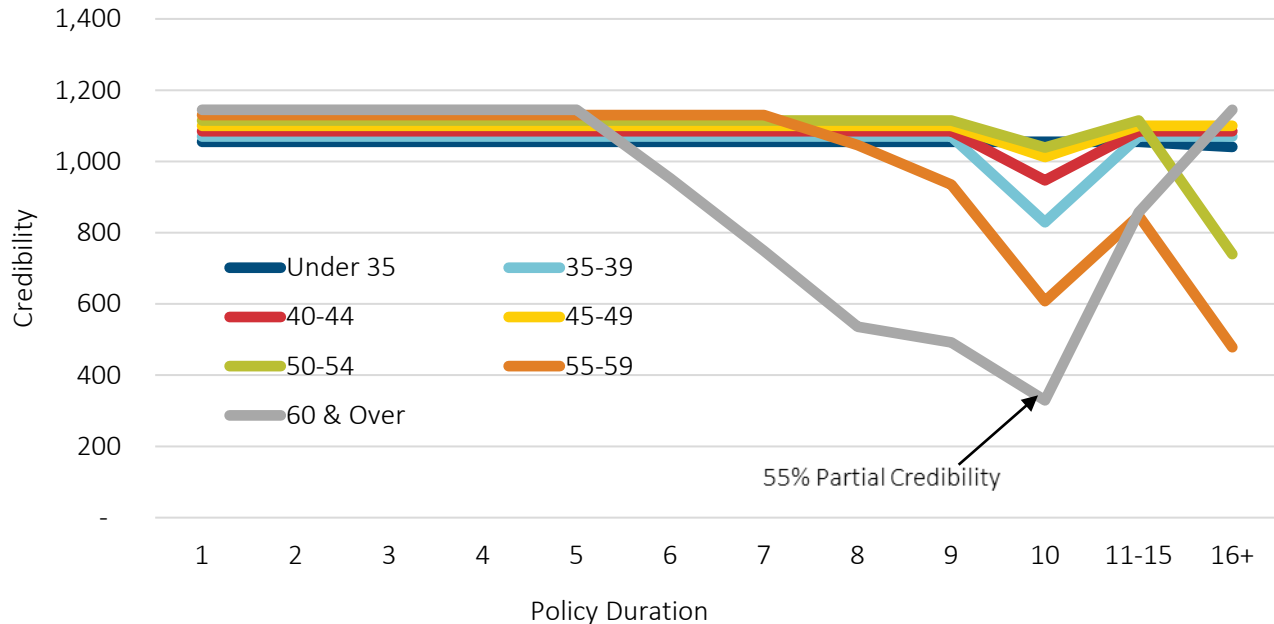
Data Credibility for Individual Lapses

Minimum of Number of Individual Lapses and 1,082 (Full Credibility) by Issue Age Group and Policy Duration



Data Credibility for Group Lapses

Minimum of Number of Group Lapses and 1,082 (Full Credibility) by Issue Age Group and Policy Duration



Mortality Improvement to 2020



Recommended Mortality Improvement

- The study period is 2008 through 2011
- Recommend to apply improvement trend using the 2012 Individual Annuity Mortality Basic tables (2012 IAM) G2 scale from 2010 to 2020 (11 years)
- Recommended tables represent industry experience as of 2020
- G2 scale applies to both total lives and active lives



Alternatives for Mortality Improvement

- The mortality tables can be made dynamic by continuing to apply the G2 scale to future valuation dates
- For first principle valuation approach, G2 scale can be applied to both active lives and disabled lives



Recommended Margins



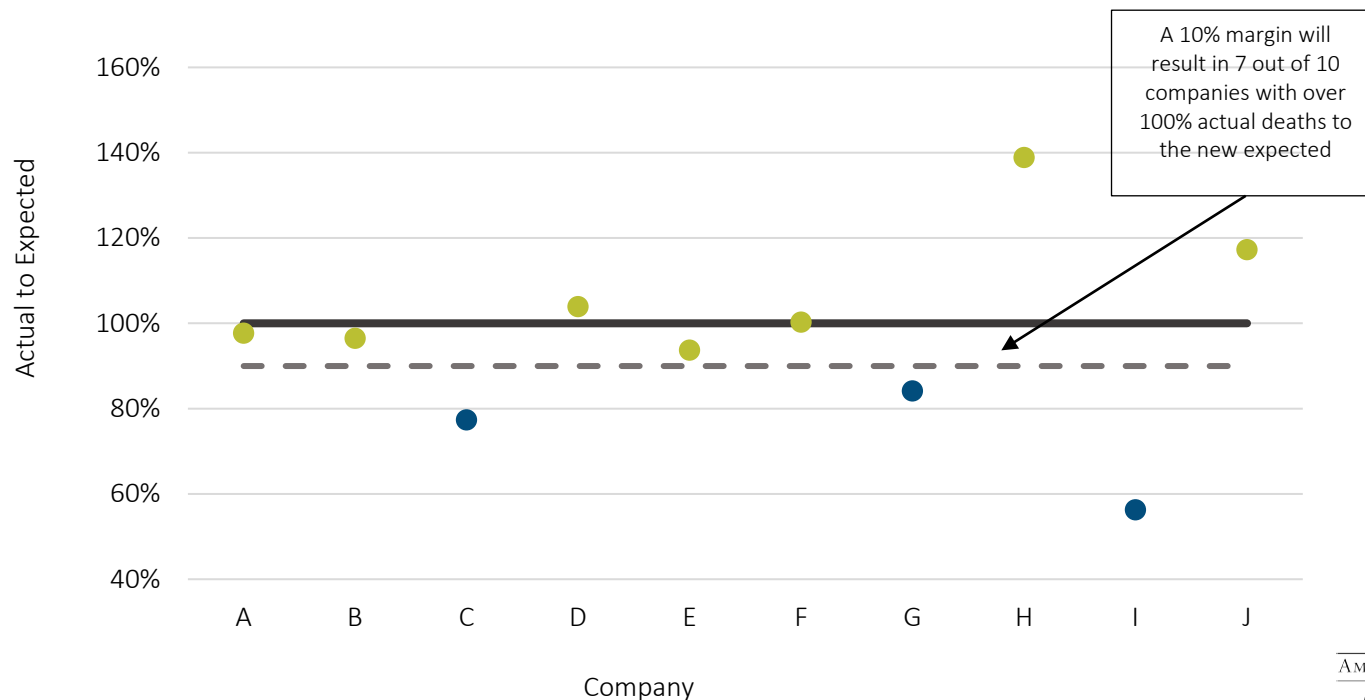
Recommended Margins

- 10% for mortality
- 15% for lapse
- Same for total lives and active lives



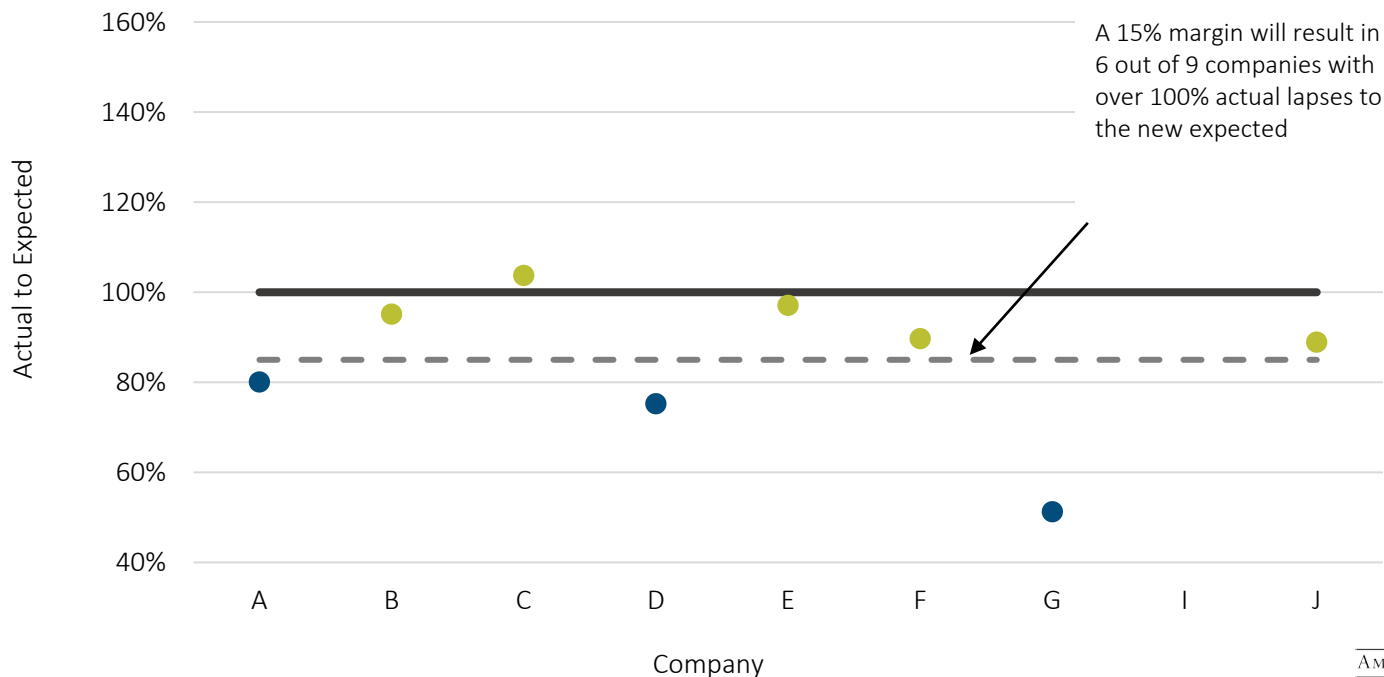
Actual Total Lives Mortality to Expected (Based on Recommended Tables) By Company

Actual-to-Expected Mortality, Total Lives by Company, Without Margins, Policy Years 11 & Over



Actual Individual Total Lives Lapses to Expected (Based on Recommended Tables) By Company

Actual-to-Expected Lapses, Individual Total Lives, by Company, Without Margins, Policy Years 11 & Over

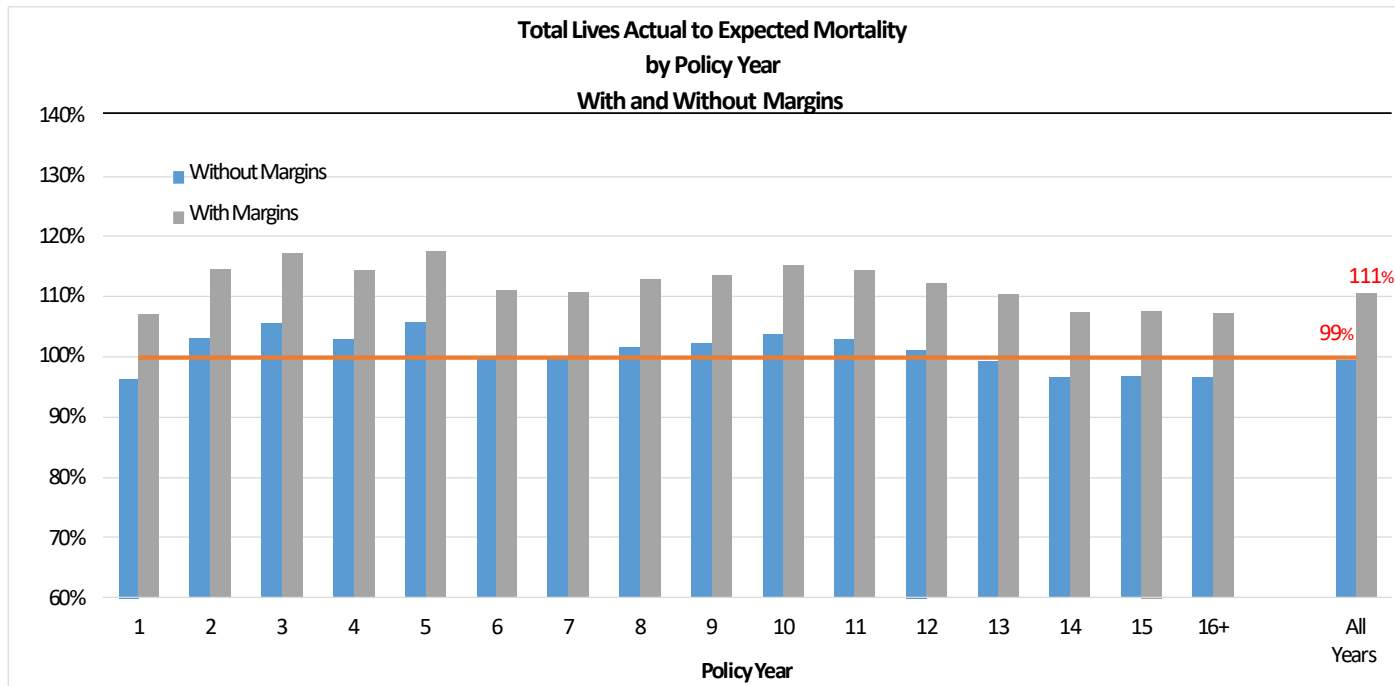


Actual to Expected Mortality Rates

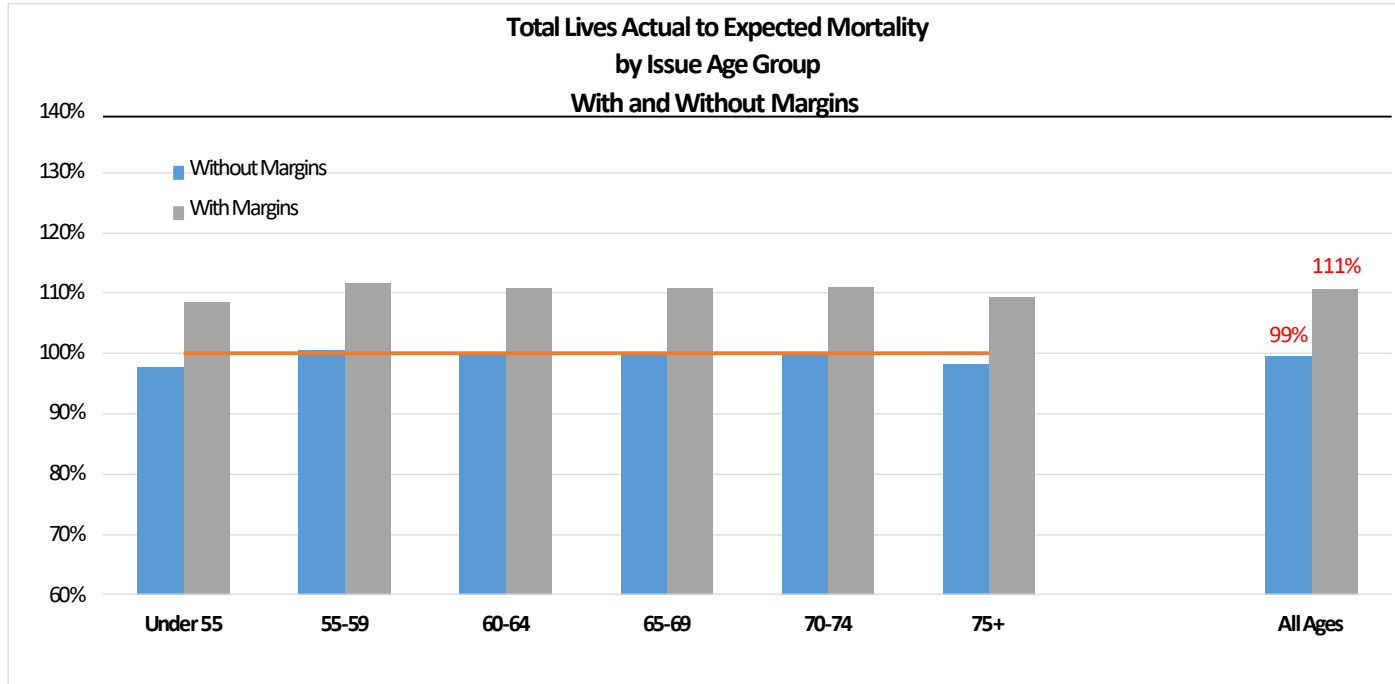
(Expected Based on Recommended Tables)



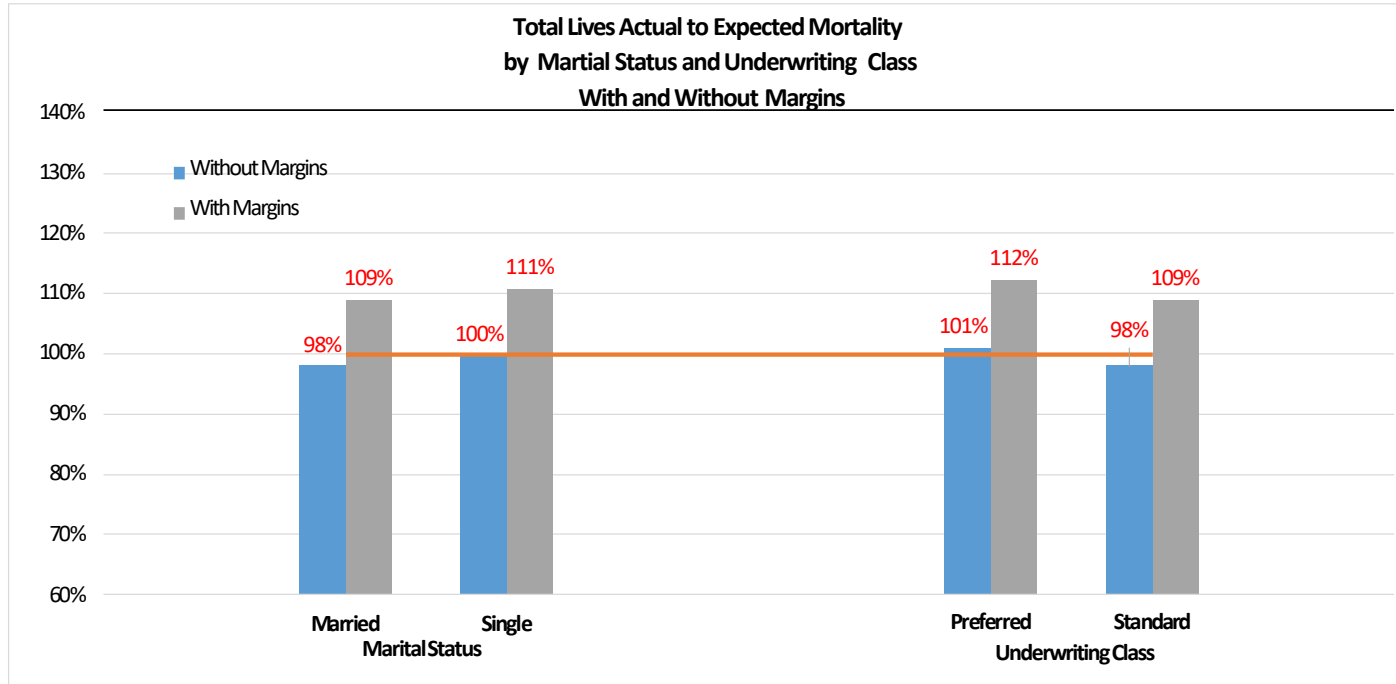
Actual Total Lives Mortality to Expected by Policy Year



Actual Total Lives Mortality to Expected by Issue Age Group



Actual Total Lives Mortality to Expected by Marital Status and Underwriting Class



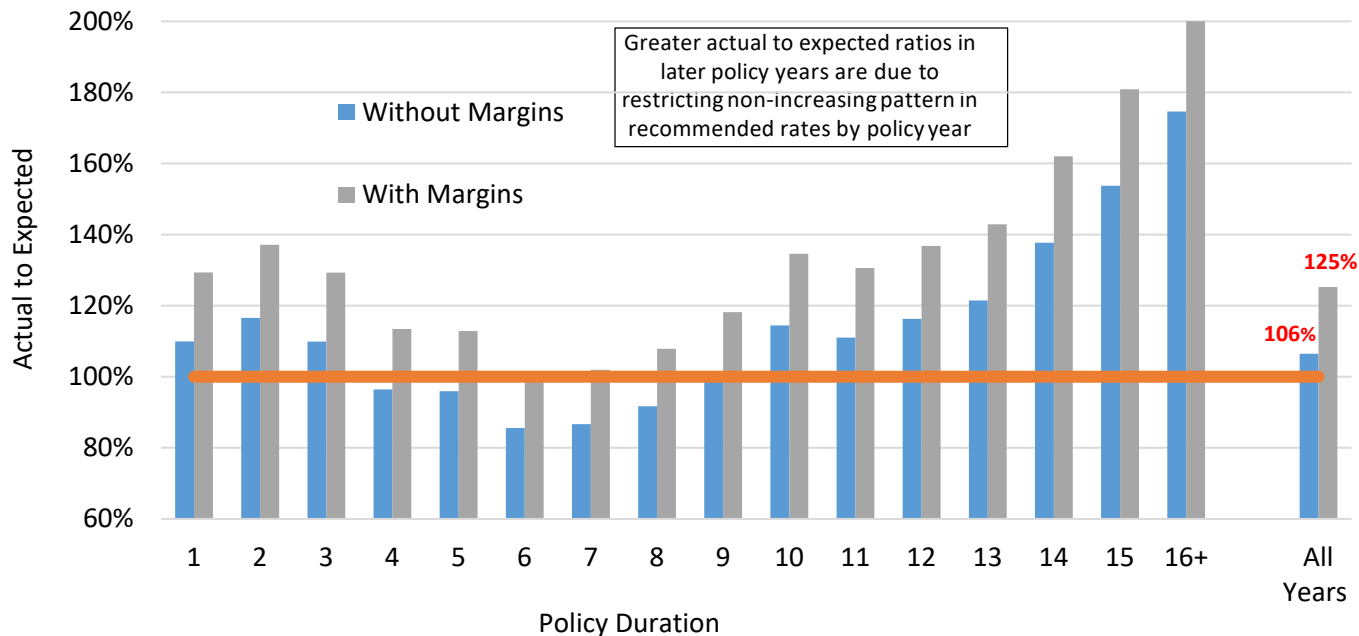
Actual to Expected Lapse Rates

(Expected Based on Recommended)



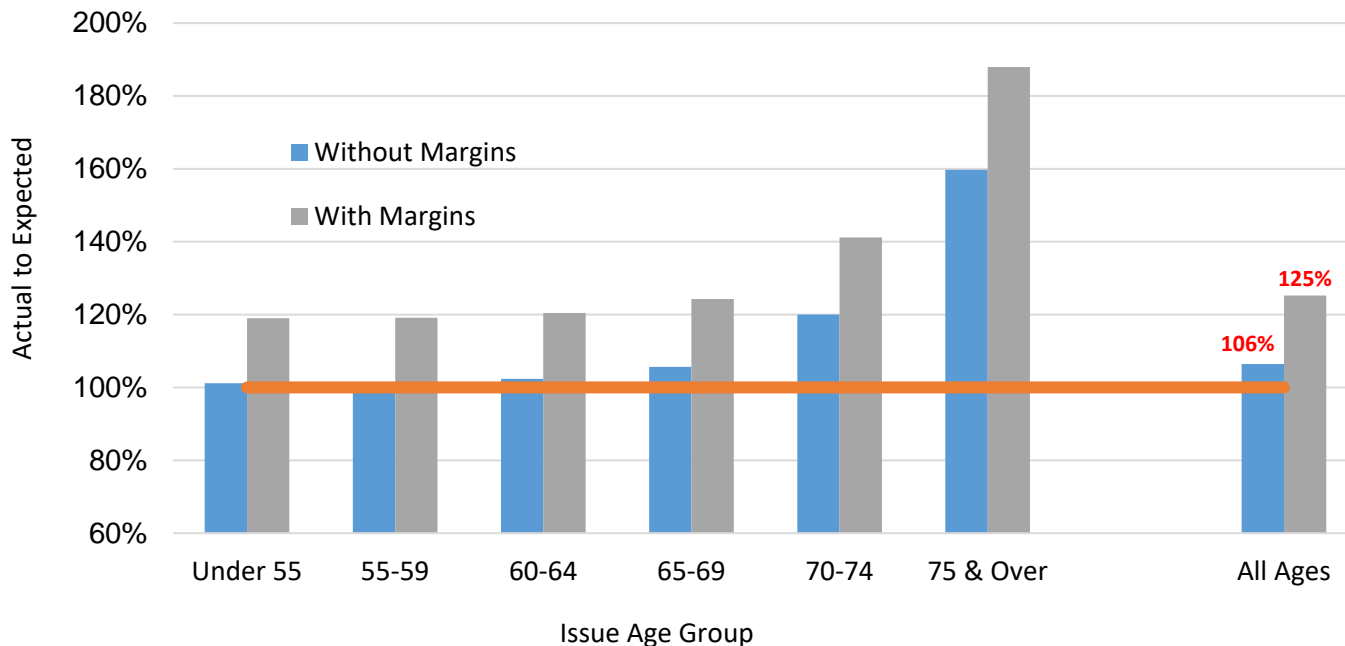
Actual Individual Total Lives Lapses to Expected by Policy Year

Actual-to-Expected Lapses, Individual Total Lives, by Policy Duration, With and Without Margins



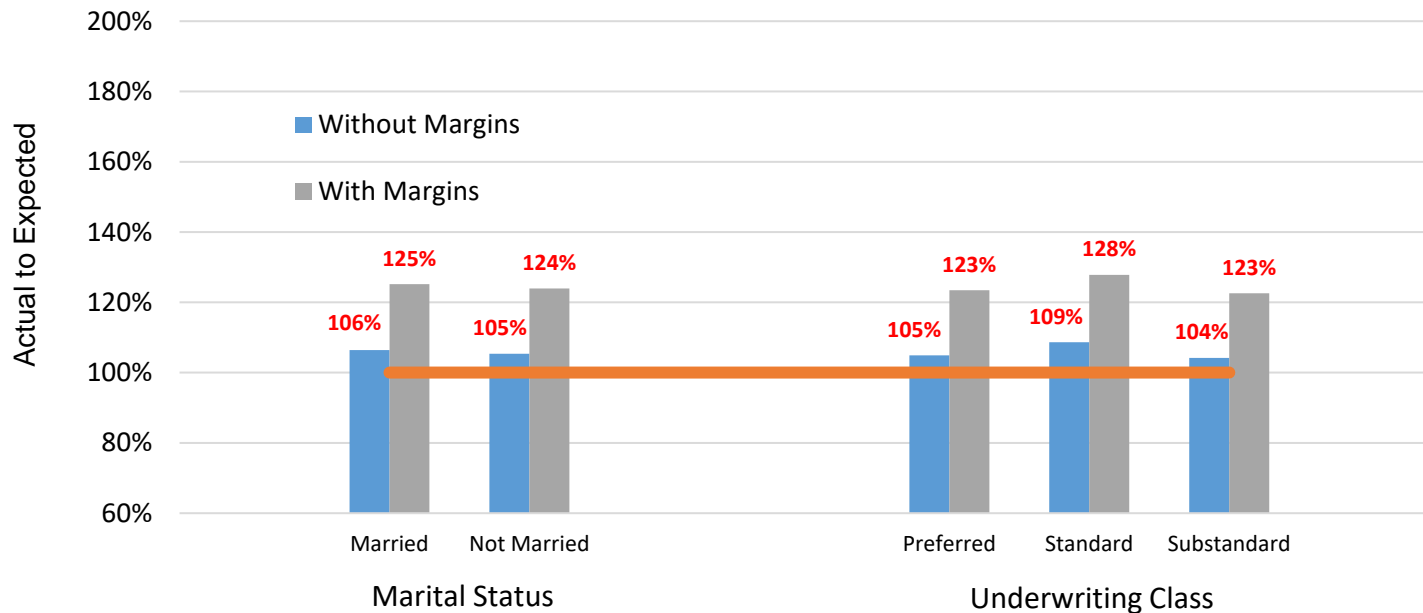
Actual Individual Total Lives Lapses to Expected by Issue Age Group

Actual-to-Expected Lapses, Individual Total Lives, by Issue Age Group, With and Without Margins

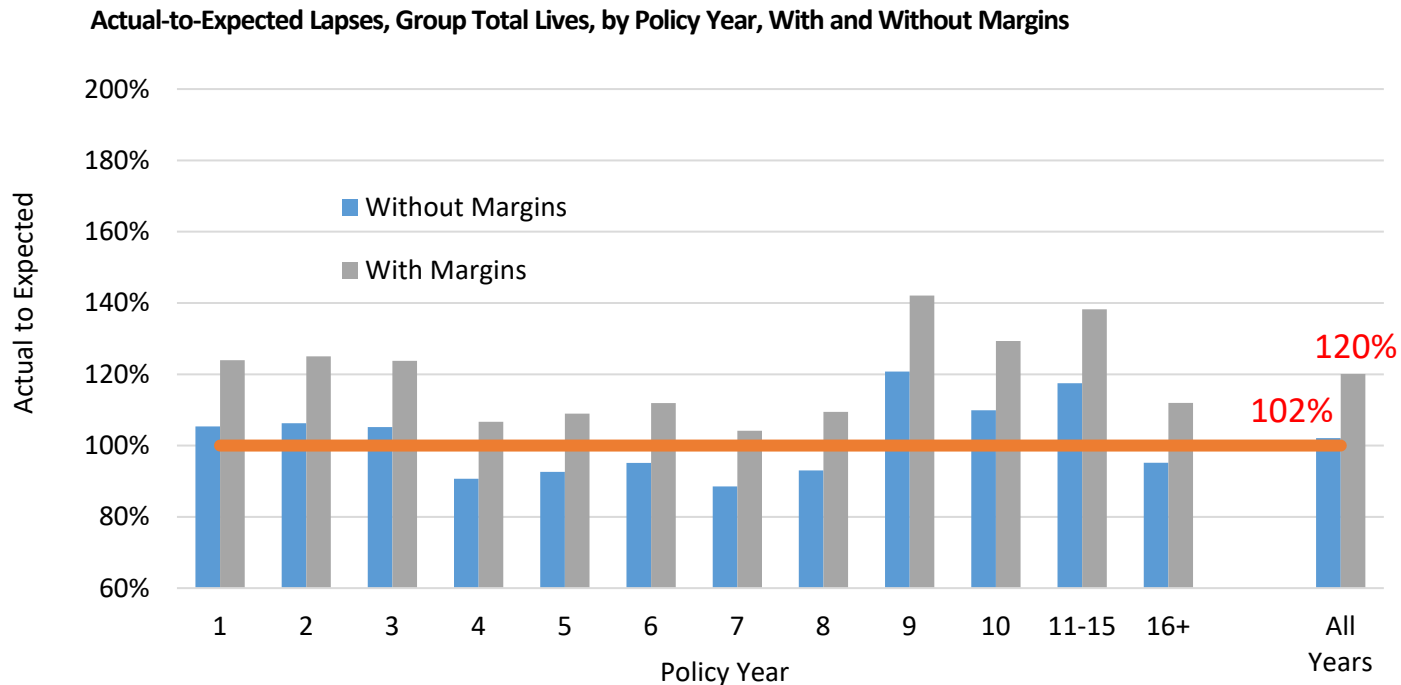


Actual Individual Total Lives Lapses to Expected by Marital Status and Underwriting Class

Actual-to-Expected Lapses, Individual Total Lives, by Marital Status and Underwriting Class, With and Without Margins

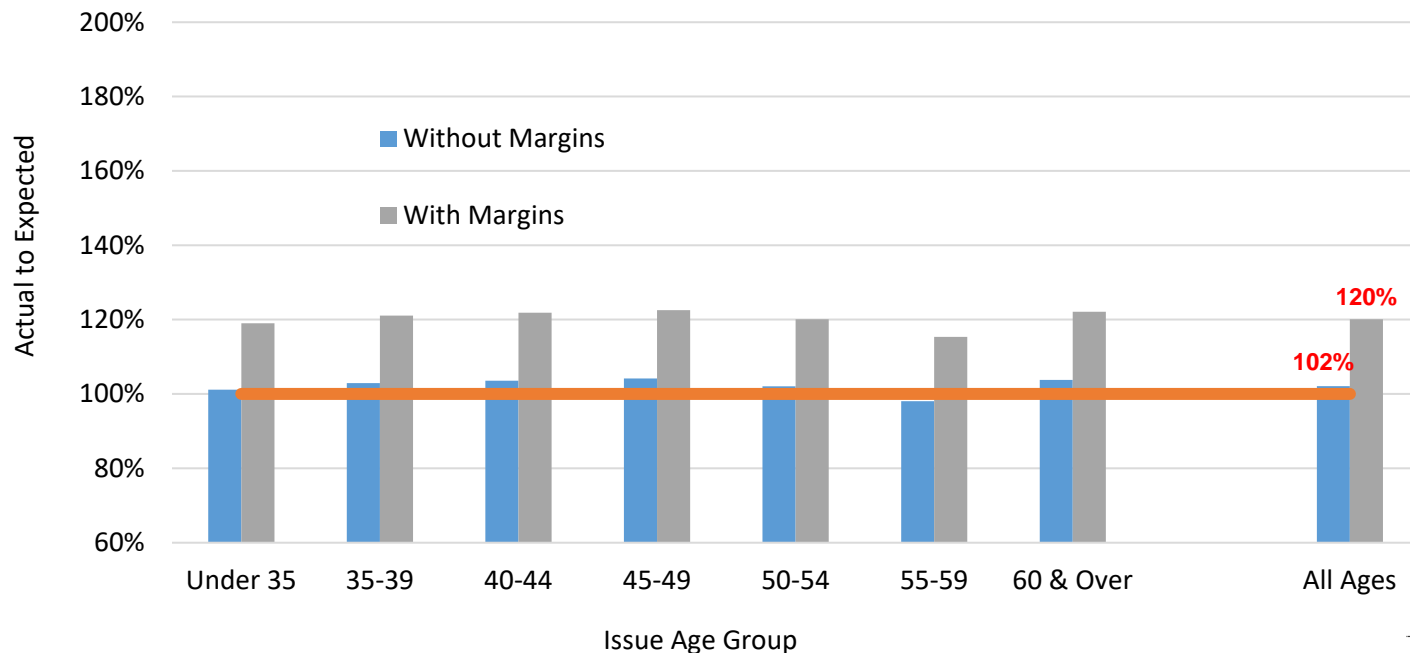


Actual Group Total Lives Lapses to Expected by Policy Year



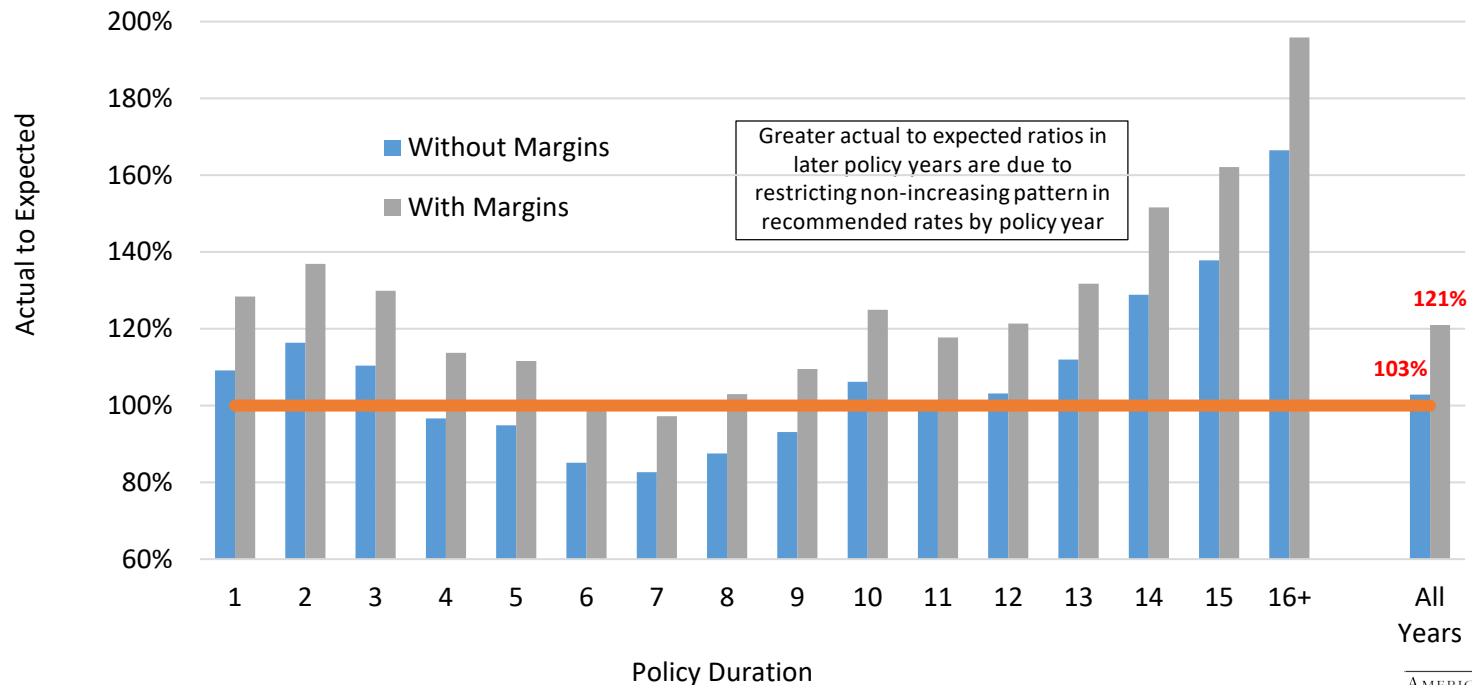
Actual Group Total Lives Lapses to Expected by Issue Age Group

Actual-to-Expected Lapses, Group Total Lives, by Issue Age Group, With and Without Margins



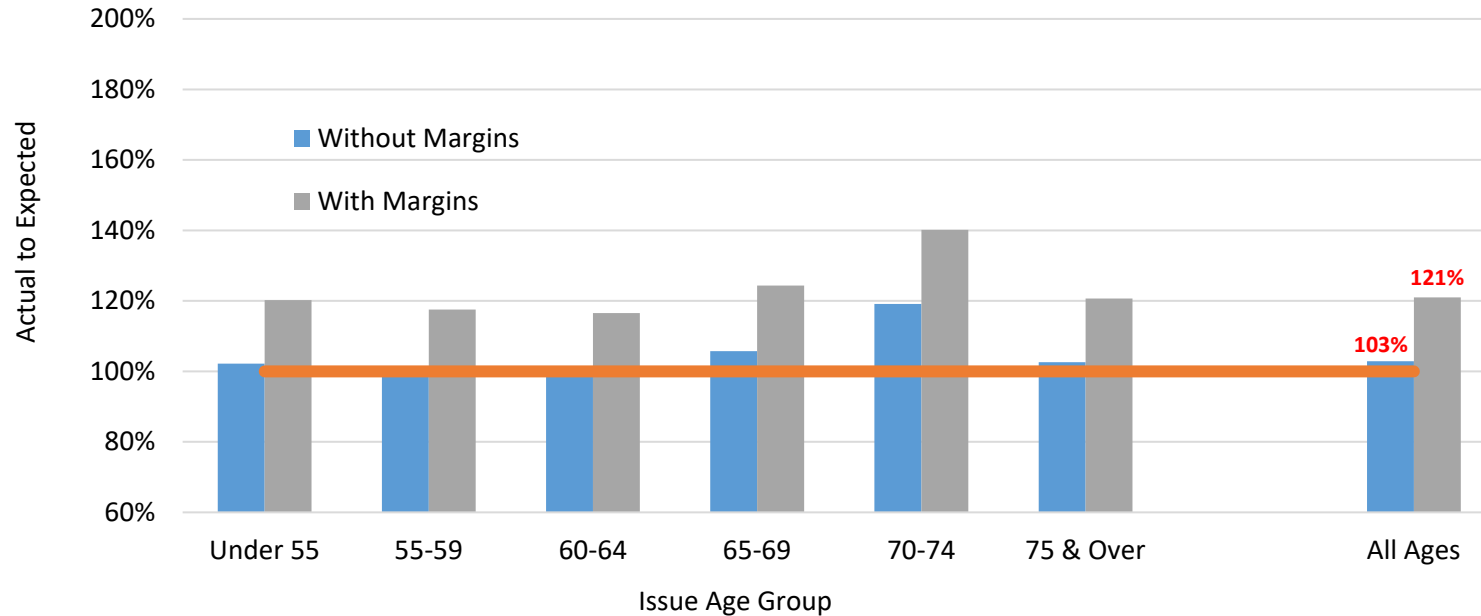
Actual Individual Active Lives Lapses to Lapses by Policy Year

Actual-to-Expected Lapses, Individual Active Lives, by Policy Duration, With and Without Margins



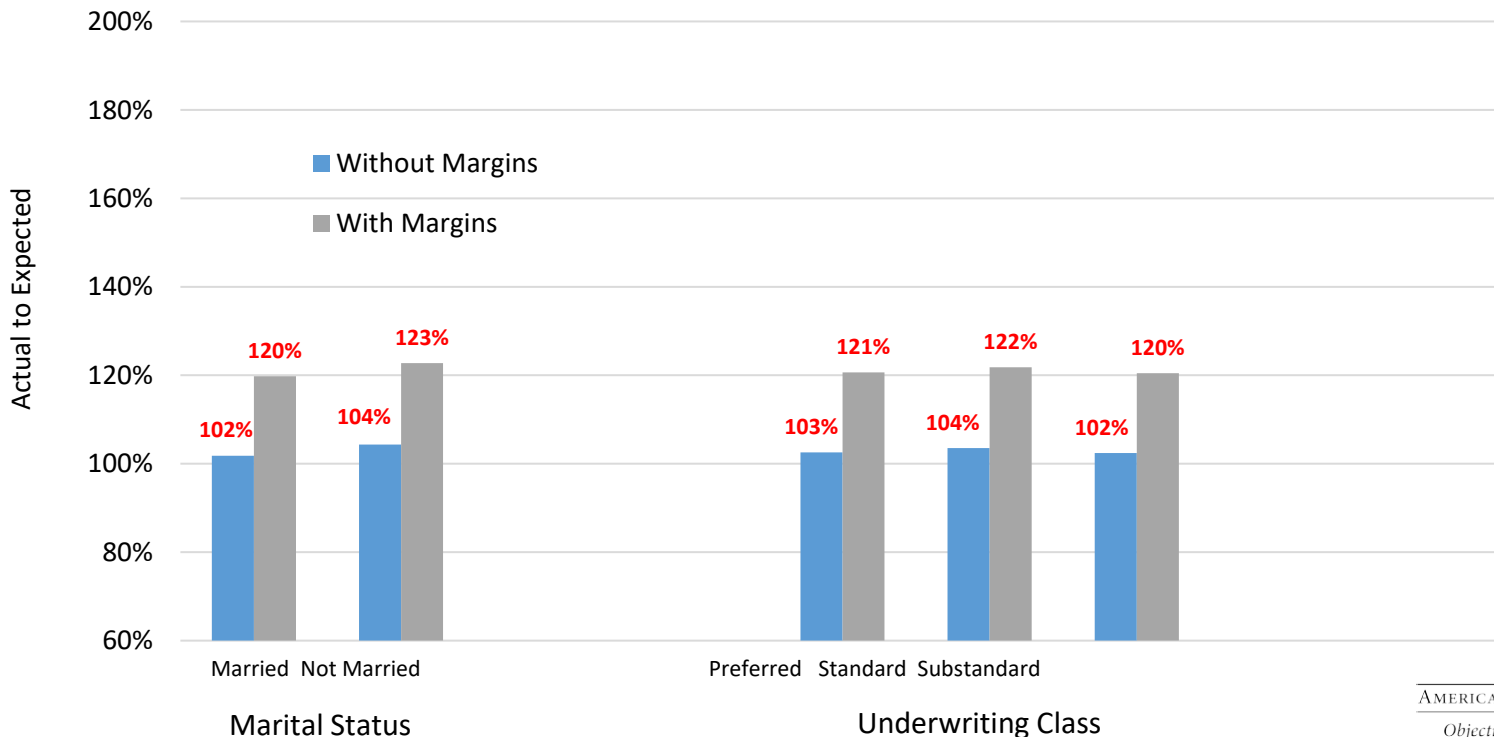
Actual Individual Active Lives Lapses to Expected by Issue Age Group

Actual-to-Expected Lapses, Individual Active Lives, by Issue Age Group, With and Without Margins



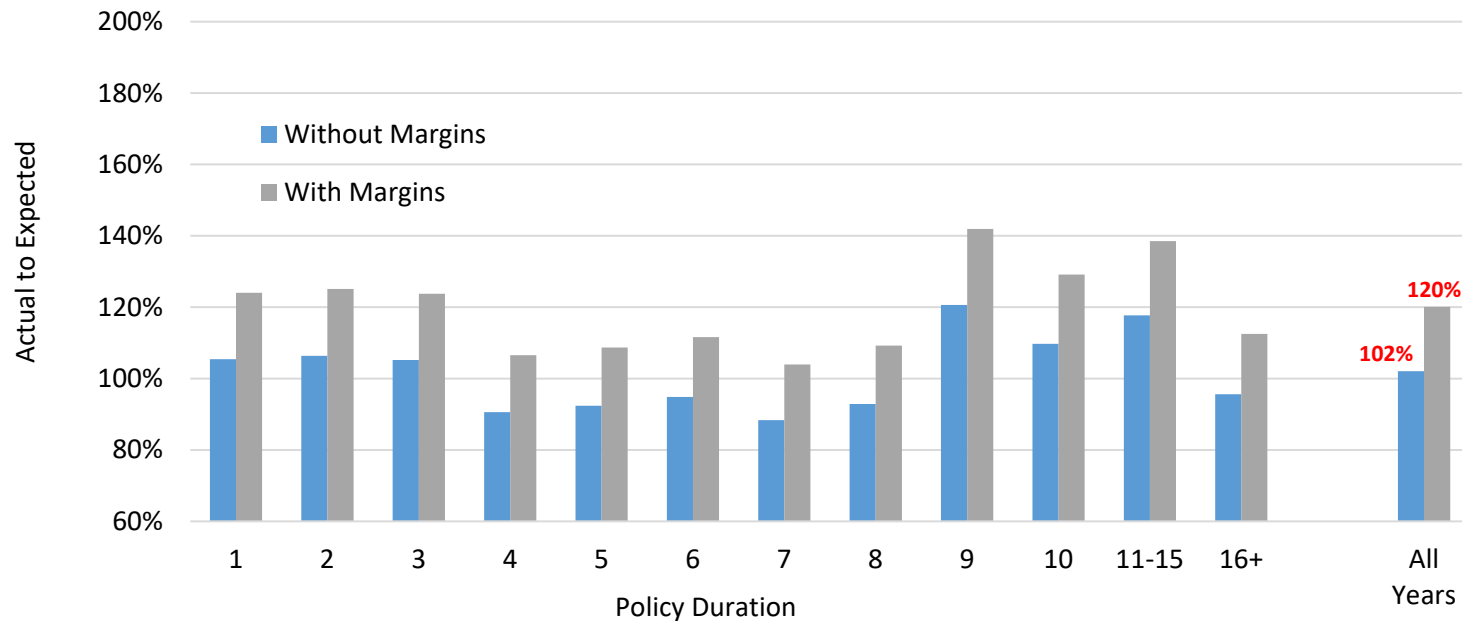
Actual Individual Active Lives Lapses to Expected by Marital Status and Underwriting Class

Actual-to-Expected Lapses, Individual Active Lives, by Marital Status and Underwriting Class, With and Without Margins



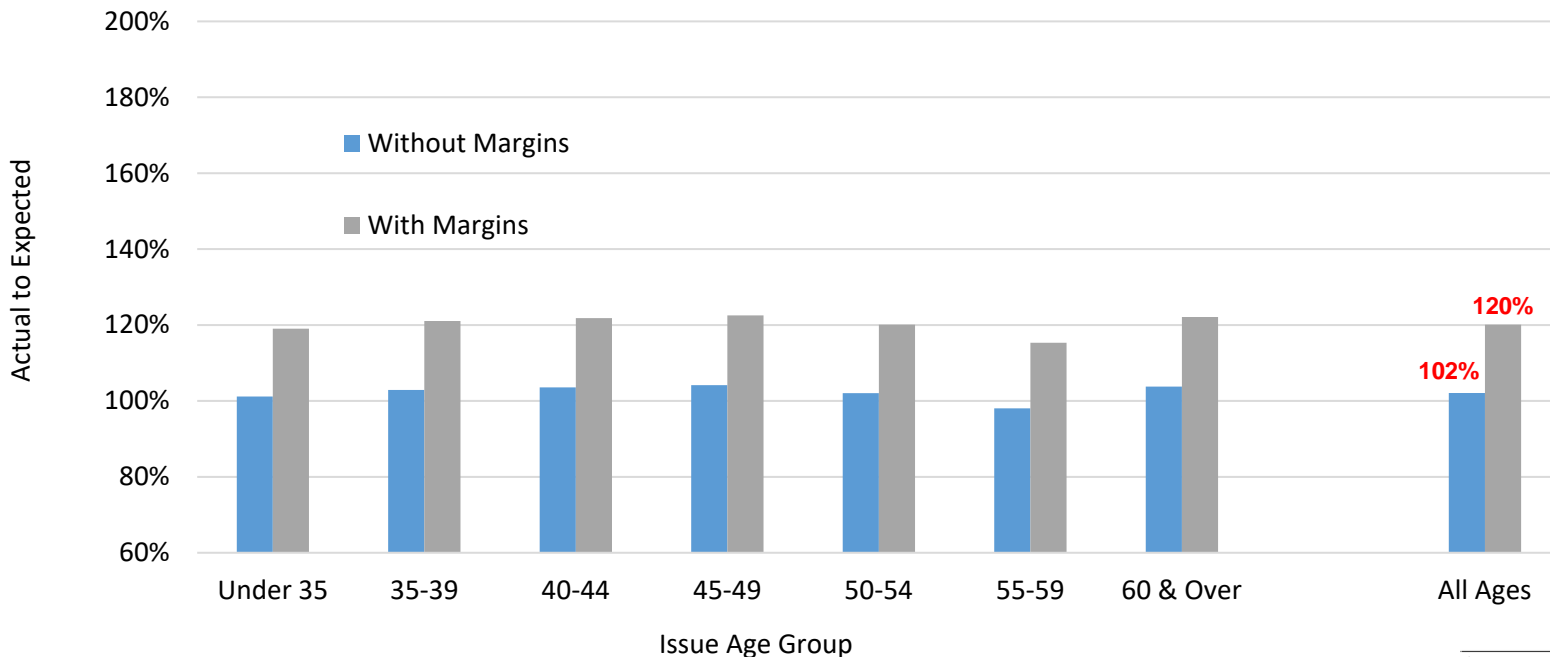
Actual Group Active Lives Lapses to Expected by Policy Year

Actual-to-Expected Lapses, Group Active Lives, by Policy Duration, With and Without Margins



Actual Group Active Lives Lapses to Expected by Issue Age Group

Actual-to-Expected, Group Active Lives, by Issue Age Group, With and Without Margins



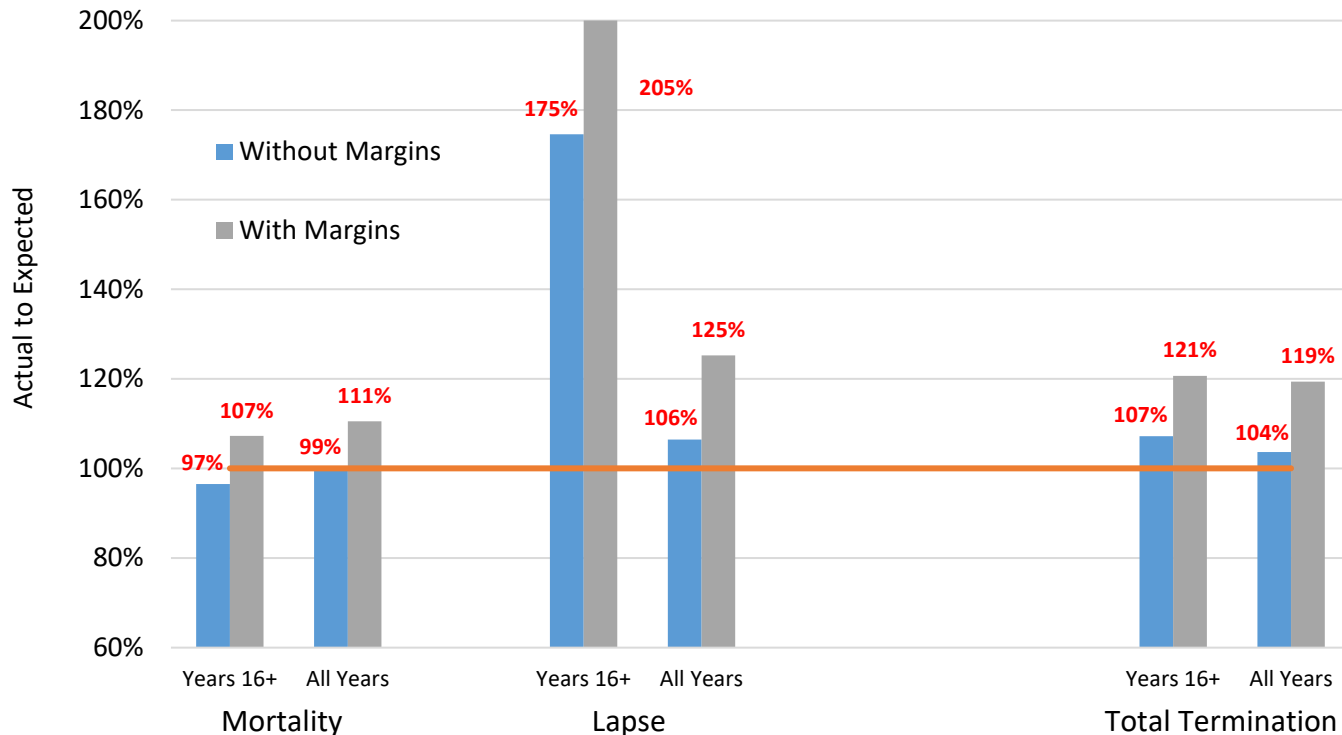
Actual to Expected Total Policy Termination Rates

(Mortality and Lapse Combined—Total Lives Only)



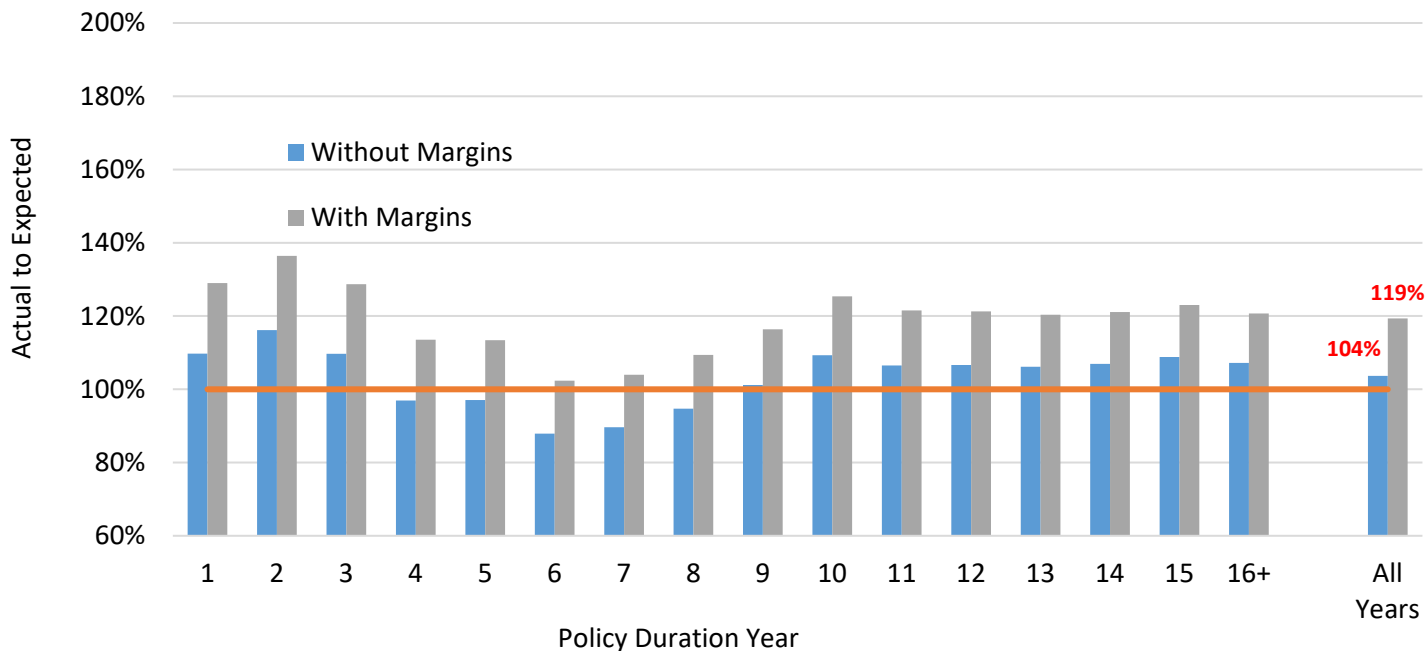
Actual Individual Total Lives to Expected by Mortality and Lapse

Actual-to-Expected Mortality and Lapse, Individual Total Lives, With and Without Margins



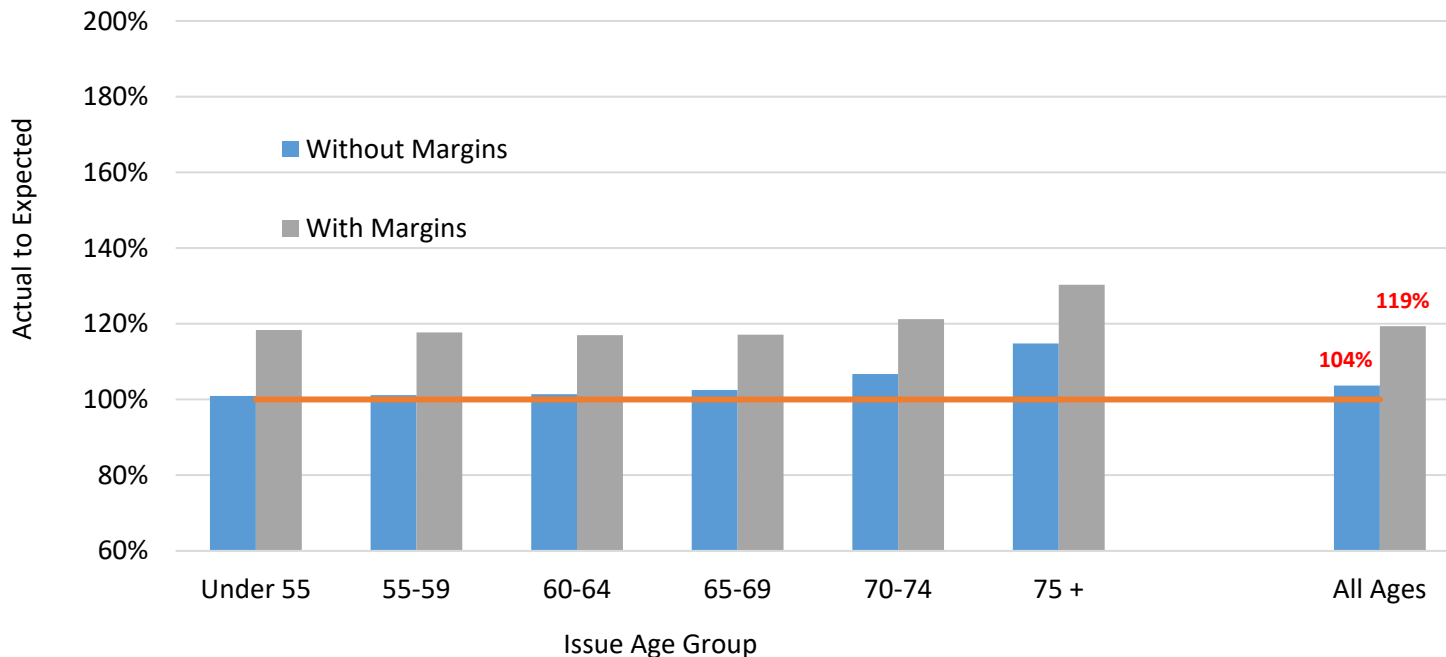
Actual Individual Total Lives Total Terminations to Expected by Policy Year

Actual-to-Expected Total Terminations, Individual Total Lives, by Policy Year, With and Without Margins



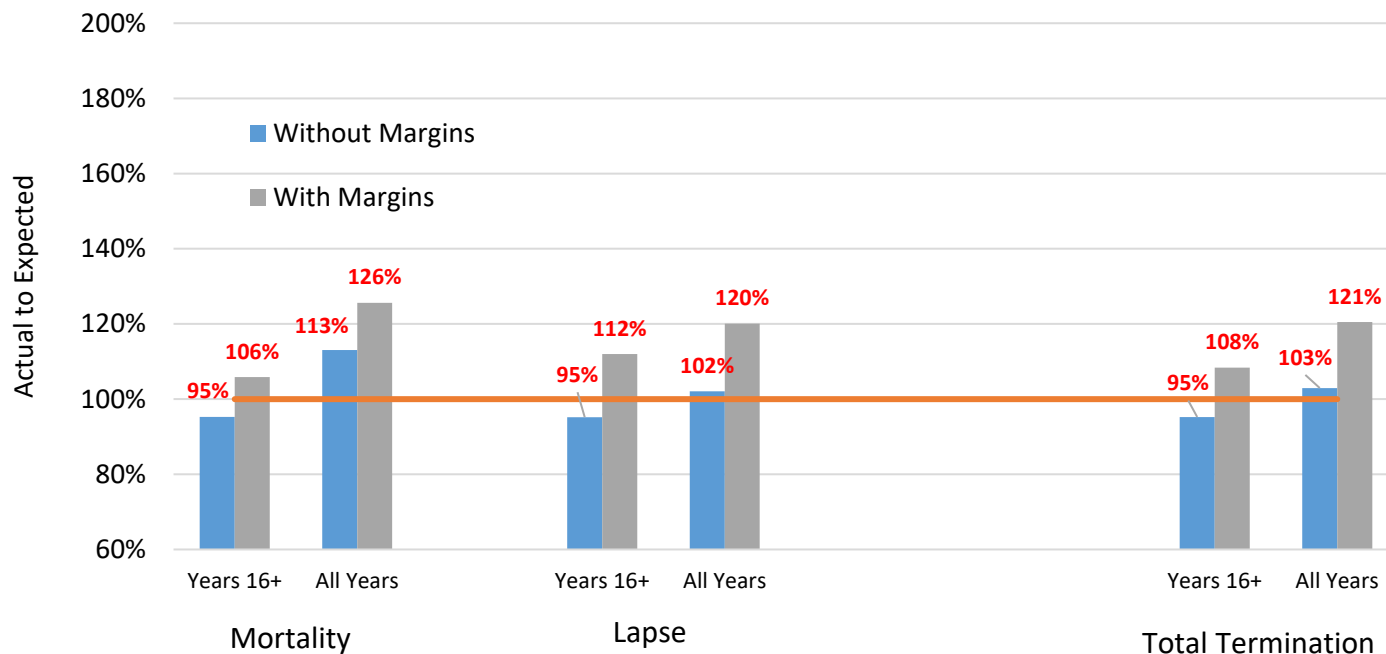
Actual Individual Total Lives Total Terminations to Expected by Issue Age Group

Actual-to-Expected Total Terminations, Individual Total Lives, by Issue Age Group, With and Without Margins



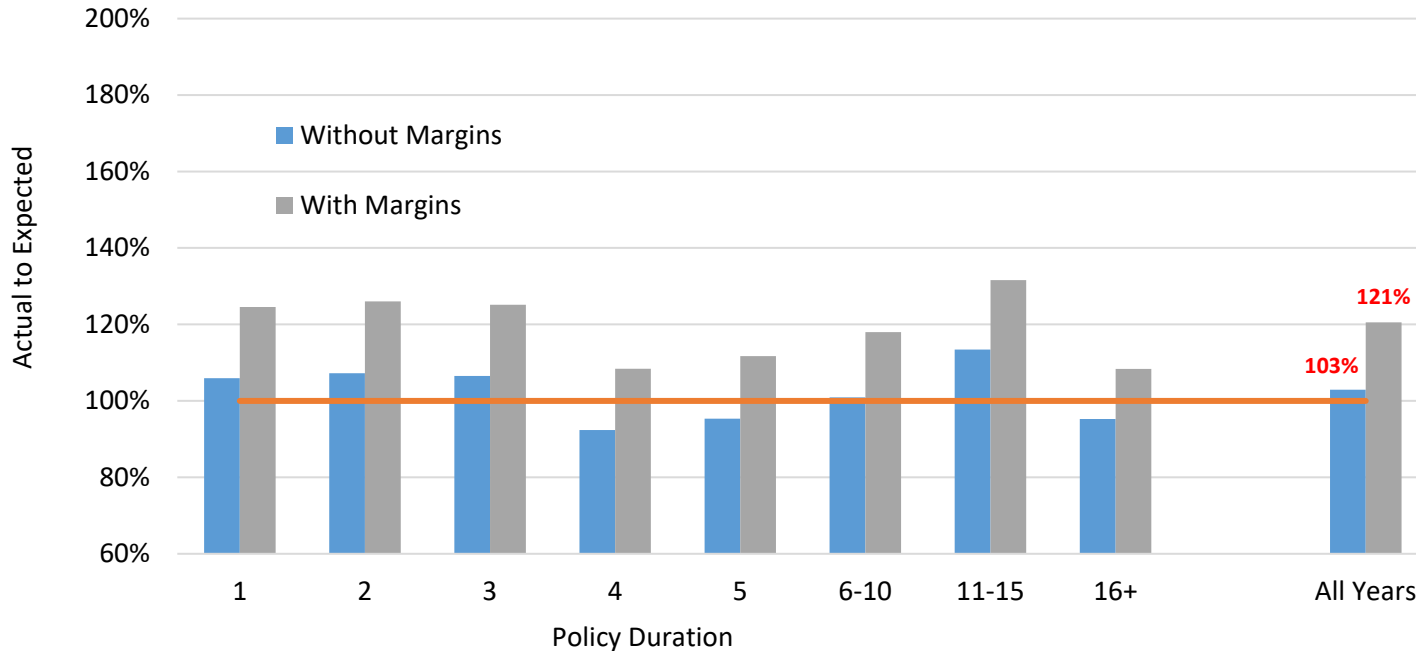
Actual Group Total Lives to Expected by Mortality and Lapse

Actual-to-Expected Mortality and Lapse, Group Total Lives, With and Without Margins



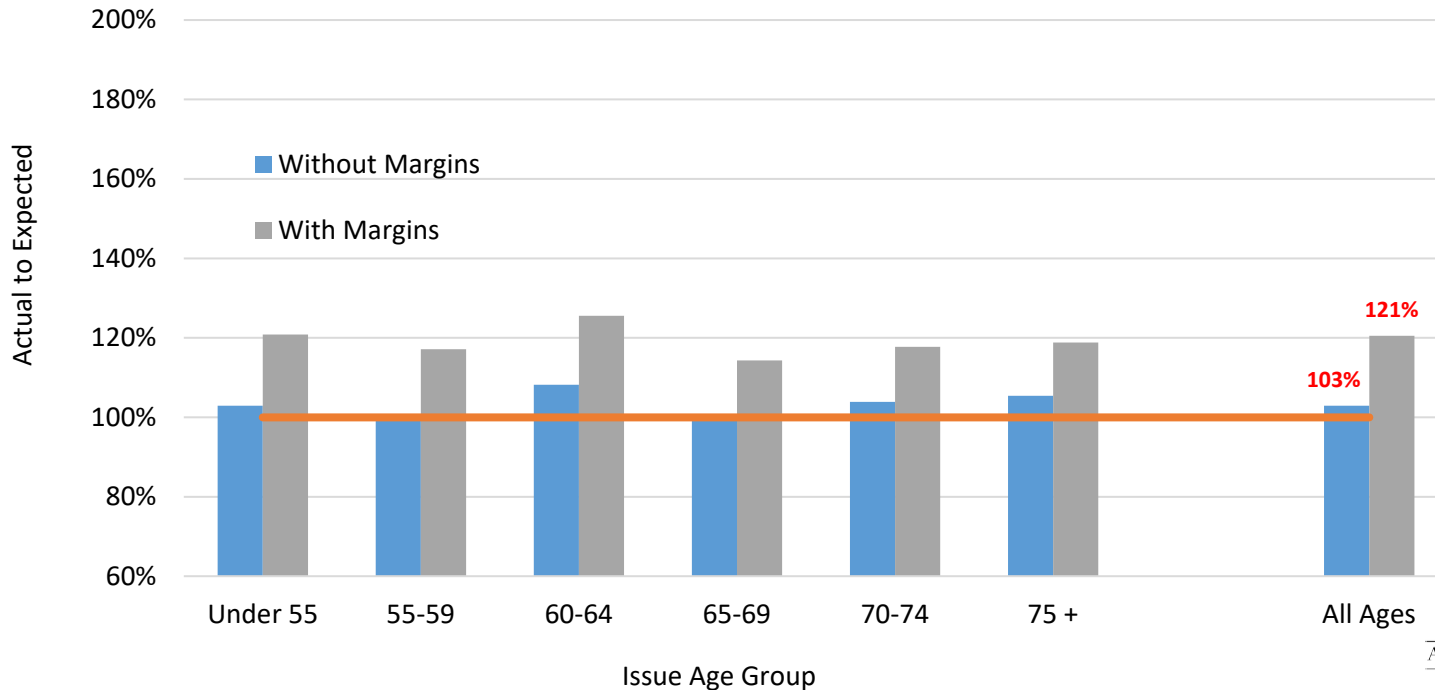
Actual Group Total Lives Total Terminations to Expected by Policy Year

Actual-to-Expected Total Terminations, Group Total Lives, by Policy Duration, With and Without Margins



Actual Group Total Lives Total Terminations to Expected by Issue Age Group

Actual-to-Expected Total Terminations, Group Total Lives, by Issue Age Group, With and Without Margins



Additional Information

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