

**PROPOSED AMENDED RULE 38**  
**AN ANNUITY MORTALITY TABLE**  
**FOR USE IN DETERMINING RESERVE LIABILITIES FOR ANNUITIES**

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**Section 1. Purpose**

The purpose of this rule is to recognize the following mortality tables for use in determining the minimum standard of valuation for annuity and pure endowment contracts: the 1983 Table “a”, the 1983 Group Annuity Mortality (1983 GAM) Table, the Annuity 2000 Mortality Table, the 2012 Individual Annuity Reserving (2012 IAR) Table, and the 1994 Group Annuity Reserving (1994 GAR) Table.

**Section 2. Authority**

This rule is promulgated pursuant to the authority granted to the Arkansas Insurance Commissioner (“Commissioner”) by Ark. Code Ann. §§ 23-84-101 et seq., 23-61-108, and 25-15-201 et seq.

**Section 3. Definitions**

A. As used in this Rule “1983 Table “a”” means that mortality table developed by the Society of Actuaries Committee to Recommend a New Mortality Basis for Individual Annuity Valuation and adopted as a recognized mortality table for annuities in June 1982 by the National Association of Insurance Commissioners.

B. As Used in this Rule “1983 GAM Table” means that mortality table developed by the Society of Actuaries Committee on Annuities and adopted as a recognized mortality table for annuities in December 1983 by the National Association of Insurance Commissioners.

C. As used in this rule “1994 GAR Table” means that mortality table developed by the Society of Actuaries Group Annuity Valuation Task Force and shown on pages 866-867 of Volume XLVII of the *Transactions of the Society of Actuaries* (1995).

D. As used in this rule “Annuity 2000 Mortality Table” means that mortality table developed by the Society of Actuaries Committee on Life Insurance Research and shown on page 240 of Volume XLVII of the *Transactions of the Society of Actuaries* (1995).

E. As used in this rule, “Period table” means a table of mortality rates applicable to a given calendar year (the Period).

F. As used in this rule, “Generational mortality table” means a mortality table containing a set of mortality rates that decrease for a given age from one year to the next based on a combination of a Period table and a projection scale containing rates of mortality improvement.

G. As used in this rule “2012 IAR Mortality Table” means that Generational mortality table developed by the Society of Actuaries Committee on Life Insurance Research and containing rates,  $q_x^{2012+n}$ , derived from a combination of the 2012 IAM Period Table and Projection Scale G2, using the methodology stated in Section 5.

H. As used in this rule, “2012 Individual Annuity Mortality Period Life (2012 IAM Period) Table” means the Period table containing loaded mortality rates for calendar year 2012. This table contains rates,  $q_x^{2012}$ , developed by the Society of Actuaries Committee on Life Insurance Research and is shown in Appendices 1-2.

I. As used in this rule, “Projection Scale G2 (Scale G2)” is a table of annual rates,  $G2_x$ , of mortality improvement by age for projecting future mortality rates beyond calendar year 2012. This table was developed by the Society of Actuaries Committee on Life Insurance Research and is shown in Appendices 3-4.

#### **Section 4. Individual Annuity or Pure Endowment Contracts**

A. Except as provided in Subsections B and C of this section, the 1983 Table “a” is recognized and approved as an individual annuity mortality table for valuation and, at the option of the company, may be used for purposes of determining the minimum standard of valuation for any individual annuity or pure endowment contract issued on or after March 18, 1977.

B. Except as provided in Subsection C of this section, either the 1983 Table “a” or the Annuity 2000 Mortality Table shall be used for determining the minimum standard of valuation for any individual annuity or pure endowment contract issued on or after December 16, 1985.

C. Except as provided in Subsection D of this section, the Annuity 2000 Mortality Table shall be used for determining the minimum standard of valuation for any individual annuity or pure endowment contract issued on or after January 1, 1999.

D. Except as provided in Subsection E of this section, the 2012 IAR Mortality Table shall be used for determining the minimum standard of valuation for any individual annuity or pure endowment contract issued on or after January 1, 2015.

E. The 1983 Table “a” without projection is to be used for determining the minimum standards of valuation for an individual annuity or pure endowment contract issued on or after January 1, 1999, solely when the contract is based on life contingencies and is issued to fund periodic benefits arising from:

- (1) Settlements of various forms of claims pertaining to court settlements or out of court settlements from tort actions;
- (2) Settlements involving similar actions such as workers’ compensation claims; or
- (3) Settlements of long term disability claims where a temporary or life annuity has been used in lieu of continuing disability payments.

## **Section 5. Application of the 2012 IAR Mortality Table**

In using the 2012 IAR Mortality Table, the mortality rate for a person age  $x$  in year  $(2012 + n)$  is calculated as follows:

$$q_x^{2012+n} = q_x^{2012}(1 - G2_x)^n$$

The resulting  $q_x^{2012+n}$  shall be rounded to three decimal places per 1,000, e.g., 0.741 deaths per 1,000. Also, the rounding shall occur according to the formula above, starting at the 2012 period table rate.

For example, for a male age 30,  $q_x^{2012} = 0.741$ .

$q_x^{2013} = 0.741 * (1 - 0.010) ^ 1 = 0.73359$ , which is rounded to 0.734.

$q_x^{2014} = 0.741 * (1 - 0.010) ^ 2 = 0.7262541$ , which is rounded to 0.726.

A method leading to incorrect rounding would be to calculate  $q_x^{2014}$  as  $q_x^{2013} * (1 - 0.010)$ , or  $0.734 * 0.99 = 0.727$ . It is incorrect to use the already rounded  $q_x^{2013}$  to calculate  $q_x^{2014}$ .

## **Section 6. Group Annuity or Pure Endowment Contracts**

A. Except as provided in Subsections B and C of this section, the 1983 GAM Table, the 1983 Table “a”, and the 1994 GAR Table are recognized and approved as

group annuity mortality tables for valuation and, at the option of the company, any one of these tables may be used for purposes of valuation for any annuity or pure endowment purchased on or after March 18, 1977 under a group annuity or pure endowment contract.

B. Except as provided in Subsection C of this section, either the 1983 GAM Table or the 1994 GAR Table shall be used for determining the minimum standard of valuation for any annuity or pure endowment purchased on or after October 1, 1985 under a group annuity or pure endowment contract.

C. The 1994 GAR Table shall be used for determining the minimum standard of valuation for any annuity or pure endowment purchased on or after January 1, 1999 under a group annuity or pure endowment contract.

**Section 7. Application of the 1994 GAR Table**

In using the 1994 GAR Table, the mortality rate for a person age  $x$  in year  $(1994 + n)$  is calculated as follows:

$$q_x^{1994+n} = q_x^{1994}(1 - AA_x)^n$$

where the  $q_x^{1994}$  and  $AA_x$  are as specified in the 1994 GAR Table.

**Section 8. Separability**

If any provision of this rule or its application to any person or circumstances is for any reason held to be invalid, the remainder of the regulation and the application of its provisions to other persons or circumstances shall not be affected.

**Section 9. Effective Date**

The provisions of this rule shall be effective January 1, 2015, upon statutory filing per Arkansas law.

\_\_\_\_\_  
JAY BRADFORD  
INSURANCE COMMISSIONER  
STATE OF ARKANSAS

\_\_\_\_\_  
DATE

APPENDIX I

2012 IAM Period Table  
 Female, Age Nearest Birthday

AGE	1000	AGE	1000	AGE	1000	AGE	1000 · $q_x^{2012}$
$\cdot q_x^{2012}$		$\cdot q_x^{2012}$		$\cdot q_x^{2012}$			
0	1.621	30	0.300	60	3.460	90	88.377
1	0.405	31	0.321	61	3.916	91	97.491
2	0.259	32	0.338	62	4.409	92	107.269
3	0.179	33	0.351	63	4.933	93	118.201
4	0.137	34	0.365	64	5.507	94	130.969
5	0.125	35	0.381	65	6.146	95	146.449
6	0.117	36	0.402	66	6.551	96	163.908
7	0.110	37	0.429	67	7.039	97	179.695
8	0.095	38	0.463	68	7.628	98	196.151
9	0.088	39	0.504	69	8.311	99	213.150
10	0.085	40	0.552	70	9.074	100	230.722
11	0.086	41	0.600	71	9.910	101	251.505
12	0.094	42	0.650	72	10.827	102	273.007
13	0.108	43	0.697	73	11.839	103	295.086
14	0.131	44	0.740	74	12.974	104	317.591
15	0.156	45	0.780	75	14.282	105	340.362
16	0.179	46	0.825	76	15.799	106	362.371
17	0.198	47	0.885	77	17.550	107	384.113
18	0.211	48	0.964	78	19.582	108	400.000
19	0.221	49	1.051	79	21.970	109	400.000
20	0.228	50	1.161	80	24.821	110	400.000
21	0.234	51	1.308	81	28.351	111	400.000
22	0.240	52	1.460	82	32.509	112	400.000
23	0.245	53	1.613	83	37.329	113	400.000
24	0.247	54	1.774	84	42.830	114	400.000
25	0.250	55	1.950	85	48.997	115	400.000
26	0.256	56	2.154	86	55.774	116	400.000
27	0.261	57	2.399	87	63.140	117	400.000
28	0.270	58	2.700	88	71.066	118	400.000
29	0.281	59	3.054	89	79.502	119	400.000
						120	1000.000

APPENDIX II

2012 IAM Period Table  
Male, Age Nearest Birthday

AGE	1000	AGE	1000	AGE	1000	AGE	1000
$\cdot q_x^{2012}$		$\cdot q_x^{2012}$		$\cdot q_x^{2012}$		$\cdot q_x^{2012}$	
0	<b>1.605</b>	30	<b>0.741</b>	60	<b>5.096</b>	90	<b>109.993</b>
1	<b>0.401</b>	31	<b>0.751</b>	61	<b>5.614</b>	91	<b>123.119</b>
2	<b>0.275</b>	32	<b>0.754</b>	62	<b>6.169</b>	92	<b>137.168</b>
3	<b>0.229</b>	33	<b>0.756</b>	63	<b>6.759</b>	93	<b>152.171</b>
4	<b>0.174</b>	34	<b>0.756</b>	64	<b>7.398</b>	94	<b>168.194</b>
5	<b>0.168</b>	35	<b>0.756</b>	65	<b>8.106</b>	95	<b>185.260</b>
6	<b>0.165</b>	36	<b>0.756</b>	66	<b>8.548</b>	96	<b>197.322</b>
7	<b>0.159</b>	37	<b>0.756</b>	67	<b>9.076</b>	97	<b>214.751</b>
8	<b>0.143</b>	38	<b>0.756</b>	68	<b>9.708</b>	98	<b>232.507</b>
9	<b>0.129</b>	39	<b>0.800</b>	69	<b>10.463</b>	99	<b>250.397</b>
10	<b>0.113</b>	40	<b>0.859</b>	70	<b>11.357</b>	100	<b>268.607</b>
11	<b>0.111</b>	41	<b>0.926</b>	71	<b>12.418</b>	101	<b>290.016</b>
12	<b>0.132</b>	42	<b>0.999</b>	72	<b>13.675</b>	102	<b>311.849</b>
13	<b>0.169</b>	43	<b>1.069</b>	73	<b>15.150</b>	103	<b>333.962</b>
14	<b>0.213</b>	44	<b>1.142</b>	74	<b>16.860</b>	104	<b>356.207</b>
15	<b>0.254</b>	45	<b>1.219</b>	75	<b>18.815</b>	105	<b>380.000</b>
16	<b>0.293</b>	46	<b>1.318</b>	76	<b>21.031</b>	106	<b>400.000</b>
17	<b>0.328</b>	47	<b>1.454</b>	77	<b>23.540</b>	107	<b>400.000</b>
18	<b>0.359</b>	48	<b>1.627</b>	78	<b>26.375</b>	108	<b>400.000</b>
19	<b>0.387</b>	49	<b>1.829</b>	79	<b>29.572</b>	109	<b>400.000</b>
20	<b>0.414</b>	50	<b>2.057</b>	80	<b>33.234</b>	110	<b>400.000</b>
21	<b>0.443</b>	51	<b>2.302</b>	81	<b>37.533</b>	111	<b>400.000</b>
22	<b>0.473</b>	52	<b>2.545</b>	82	<b>42.261</b>	112	<b>400.000</b>
23	<b>0.513</b>	53	<b>2.779</b>	83	<b>47.441</b>	113	<b>400.000</b>
24	<b>0.554</b>	54	<b>3.011</b>	84	<b>53.233</b>	114	<b>400.000</b>
25	<b>0.602</b>	55	<b>3.254</b>	85	<b>59.855</b>	115	<b>400.000</b>
26	<b>0.655</b>	56	<b>3.529</b>	86	<b>67.514</b>	116	<b>400.000</b>
27	<b>0.688</b>	57	<b>3.845</b>	87	<b>76.340</b>	117	<b>400.000</b>
28	<b>0.710</b>	58	<b>4.213</b>	88	<b>86.388</b>	118	<b>400.000</b>
29	<b>0.727</b>	59	<b>4.631</b>	89	<b>97.634</b>	119	<b>400.000</b>
						120	<b>1000.000</b>

APPENDIX III

Projection Scale G2  
 Female, Age Nearest Birthday

AGE	$G2_x$	AGE	$G2_x$	AGE	$G2_x$	AGE	$G2_x$
0	<b>0.010</b>	30	<b>0.010</b>	60	<b>0.013</b>	90	<b>0.006</b>
1	<b>0.010</b>	31	<b>0.010</b>	61	<b>0.013</b>	91	<b>0.006</b>
2	<b>0.010</b>	32	<b>0.010</b>	62	<b>0.013</b>	92	<b>0.005</b>
3	<b>0.010</b>	33	<b>0.010</b>	63	<b>0.013</b>	93	<b>0.005</b>
4	<b>0.010</b>	34	<b>0.010</b>	64	<b>0.013</b>	94	<b>0.004</b>
5	<b>0.010</b>	35	<b>0.010</b>	65	<b>0.013</b>	95	<b>0.004</b>
6	<b>0.010</b>	36	<b>0.010</b>	66	<b>0.013</b>	96	<b>0.004</b>
7	<b>0.010</b>	37	<b>0.010</b>	67	<b>0.013</b>	97	<b>0.003</b>
8	<b>0.010</b>	38	<b>0.010</b>	68	<b>0.013</b>	98	<b>0.003</b>
9	<b>0.010</b>	39	<b>0.010</b>	69	<b>0.013</b>	99	<b>0.002</b>
10	<b>0.010</b>	40	<b>0.010</b>	70	<b>0.013</b>	100	<b>0.002</b>
11	<b>0.010</b>	41	<b>0.010</b>	71	<b>0.013</b>	101	<b>0.002</b>
12	<b>0.010</b>	42	<b>0.010</b>	72	<b>0.013</b>	102	<b>0.001</b>
13	<b>0.010</b>	43	<b>0.010</b>	73	<b>0.013</b>	103	<b>0.001</b>
14	<b>0.010</b>	44	<b>0.010</b>	74	<b>0.013</b>	104	<b>0.000</b>
15	<b>0.010</b>	45	<b>0.010</b>	75	<b>0.013</b>	105	<b>0.000</b>
16	<b>0.010</b>	46	<b>0.010</b>	76	<b>0.013</b>	106	<b>0.000</b>
17	<b>0.010</b>	47	<b>0.010</b>	77	<b>0.013</b>	107	<b>0.000</b>
18	<b>0.010</b>	48	<b>0.010</b>	78	<b>0.013</b>	108	<b>0.000</b>
19	<b>0.010</b>	49	<b>0.010</b>	79	<b>0.013</b>	109	<b>0.000</b>
20	<b>0.010</b>	50	<b>0.010</b>	80	<b>0.013</b>	110	<b>0.000</b>
21	<b>0.010</b>	51	<b>0.010</b>	81	<b>0.012</b>	111	<b>0.000</b>
22	<b>0.010</b>	52	<b>0.011</b>	82	<b>0.012</b>	112	<b>0.000</b>
23	<b>0.010</b>	53	<b>0.011</b>	83	<b>0.011</b>	113	<b>0.000</b>
24	<b>0.010</b>	54	<b>0.011</b>	84	<b>0.010</b>	114	<b>0.000</b>
25	<b>0.010</b>	55	<b>0.012</b>	85	<b>0.010</b>	115	<b>0.000</b>
26	<b>0.010</b>	56	<b>0.012</b>	86	<b>0.009</b>	116	<b>0.000</b>
27	<b>0.010</b>	57	<b>0.012</b>	87	<b>0.008</b>	117	<b>0.000</b>
28	<b>0.010</b>	58	<b>0.012</b>	88	<b>0.007</b>	118	<b>0.000</b>
29	<b>0.010</b>	59	<b>0.013</b>	89	<b>0.007</b>	119	<b>0.000</b>
						120	<b>0.000</b>

APPENDIX IV

Projection Scale G2  
Male, Age Nearest Birthday

AGE	$G2_x$	AGE	$G2_x$	AGE	$G2_x$	AGE	$G2_x$
0	<b>0.010</b>	30	<b>0.010</b>	60	<b>0.015</b>	90	<b>0.007</b>
1	<b>0.010</b>	31	<b>0.010</b>	61	<b>0.015</b>	91	<b>0.007</b>
2	<b>0.010</b>	32	<b>0.010</b>	62	<b>0.015</b>	92	<b>0.006</b>
3	<b>0.010</b>	33	<b>0.010</b>	63	<b>0.015</b>	93	<b>0.005</b>
4	<b>0.010</b>	34	<b>0.010</b>	64	<b>0.015</b>	94	<b>0.005</b>
5	<b>0.010</b>	35	<b>0.010</b>	65	<b>0.015</b>	95	<b>0.004</b>
6	<b>0.010</b>	36	<b>0.010</b>	66	<b>0.015</b>	96	<b>0.004</b>
7	<b>0.010</b>	37	<b>0.010</b>	67	<b>0.015</b>	97	<b>0.003</b>
8	<b>0.010</b>	38	<b>0.010</b>	68	<b>0.015</b>	98	<b>0.003</b>
9	<b>0.010</b>	39	<b>0.010</b>	69	<b>0.015</b>	99	<b>0.002</b>
10	<b>0.010</b>	40	<b>0.010</b>	70	<b>0.015</b>	100	<b>0.002</b>
11	<b>0.010</b>	41	<b>0.010</b>	71	<b>0.015</b>	101	<b>0.002</b>
12	<b>0.010</b>	42	<b>0.010</b>	72	<b>0.015</b>	102	<b>0.001</b>
13	<b>0.010</b>	43	<b>0.010</b>	73	<b>0.015</b>	103	<b>0.001</b>
14	<b>0.010</b>	44	<b>0.010</b>	74	<b>0.015</b>	104	<b>0.000</b>
15	<b>0.010</b>	45	<b>0.010</b>	75	<b>0.015</b>	105	<b>0.000</b>
16	<b>0.010</b>	46	<b>0.010</b>	76	<b>0.015</b>	106	<b>0.000</b>
17	<b>0.010</b>	47	<b>0.010</b>	77	<b>0.015</b>	107	<b>0.000</b>
18	<b>0.010</b>	48	<b>0.010</b>	78	<b>0.015</b>	108	<b>0.000</b>
19	<b>0.010</b>	49	<b>0.010</b>	79	<b>0.015</b>	109	<b>0.000</b>
20	<b>0.010</b>	50	<b>0.010</b>	80	<b>0.015</b>	110	<b>0.000</b>
21	<b>0.010</b>	51	<b>0.011</b>	81	<b>0.014</b>	111	<b>0.000</b>
22	<b>0.010</b>	52	<b>0.011</b>	82	<b>0.013</b>	112	<b>0.000</b>
23	<b>0.010</b>	53	<b>0.012</b>	83	<b>0.013</b>	113	<b>0.000</b>
24	<b>0.010</b>	54	<b>0.012</b>	84	<b>0.012</b>	114	<b>0.000</b>
25	<b>0.010</b>	55	<b>0.013</b>	85	<b>0.011</b>	115	<b>0.000</b>
26	<b>0.010</b>	56	<b>0.013</b>	86	<b>0.010</b>	116	<b>0.000</b>
27	<b>0.010</b>	57	<b>0.014</b>	87	<b>0.009</b>	117	<b>0.000</b>
28	<b>0.010</b>	58	<b>0.014</b>	88	<b>0.009</b>	118	<b>0.000</b>
29	<b>0.010</b>	59	<b>0.015</b>	89	<b>0.008</b>	119	<b>0.000</b>
						120	<b>0.000</b>