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Standard Life Table Mortality 2009 Egyptian Life Insurance Companies 2003 to 2006

By Mohamed F. Amer

INTRODUCTION

The purpose of this project was to investigate Egyptian life insurance mortality for ordinary standard life insurance business in Egypt, for the period July 7, 2003 to June 30, 2006.

The study was on combined male and female experience, as sex was not recorded with all data. Also it was based on number of policies and not individuals insured. The study was on aggregate basis and a select and ultimate study is planned for the next study.

Data from two major companies were included. These were the same companies that were analyzed in the previous mortality study as the other companies were recently established and provided incomplete data. It was decided to exclude the newer companies for the current study because

most of the business will be in the select period and will be included in the next study which will allow for a two year select period—possibly with male and female analysis.

All substandard business was excluded together with all single premium and paid-up business.

The last Egyptian insurance mortality study was published in 1996 for experience for time interval 1986-1991.

GRADUATION OF CRUDE RATES

Several attempts were made and tests for the weighted sum of the squares of the differences were calculated with weights being the exposures.

The graduation with reference to the British A49/52 ultimate gave the least deviation from the crude rates and was applied.

$$WSSE = \sum [W^i \cdot (q^{i \text{ actual}} - q^{i \text{ fitted}})^2]$$

$$\text{Graduated } q_x = -0.00070 + 1.148 * q_x^{(A49/52)}$$

Because the data after age 65 were not sufficient, it was found that extending the table far beyond age 65 is not reliable.

Age (x)	Crude 100000.qx	Exposure Weights	Gompertz Formula			w.r.t A49/52		w.r.t. A67/70	
			(1000000. μx)	(100000. qx)	WSSE*	(100000. qx)	WSSE*	(100000. qx)	WSSE*
22.5	40.6	3.4%	25.7	27.2	7.6	58.1	10.3	64.4	19.2
27.5	59	7.6%	45.7	48.4	13.3	60.4	0.1	57.1	10.8
32.5	78.4	13.1%	81.5	86.3	1.2	69.5	10.3	56.3	64.3
37.5	122.6	17.9%	145.2	153.7	90.9	105.1	54.4	107.6	40.6
42.5	205	19.3%	258.6	273.6	548.7	211.3	7.7	225.3	77.9
47.5	399.9	16.5%	460.7	486.9	591.8	443.2	308.4	447.9	366.8
52.5	886.3	13.8%	820.7	865.7	668.1	841	283.5	835.3	416.3
57.5	1450.5	8.4%	1462	1537	0.1	1468.3	27	1480.5	31.8
		100.0%			1921.7		701.8		1027.7

*Exposure weighted least sum of squared errors

FINAL RATES OF MORTALITY

Below are the resulting rates of mortality for ages 20 to 71.

Egyptian Insurance Standard Mortality Rates for 2003–2006 Medical and Nonmedical Combined

Age	1000qx	Age	1000qx
20	0.575	46	3.571
21	0.575	47	4.122
22	0.575	48	4.742
23	0.586	49	5.431
24	0.586	50	6.177
25	0.586	51	7.003
26	0.598	52	7.910
27	0.598	53	8.909
28	0.609	54	9.988
29	0.621	55	11.18
30	0.632	56	12.48
31	0.655	57	13.90
32	0.678	58	15.46
33	0.713	59	17.17
34	0.759	60	19.05
35	0.816	61	21.10
36	0.896	62	23.36
37	0.988	63	25.84
38	1.114	64	28.56
39	1.264	65	31.56
40	1.459	66	34.83
41	1.688	67	38.43
42	1.952	68	42.38
43	2.274	69	46.71
44	2.653	70	51.45
45	3.089	71	56.64

Endowment types of insurance were the most common and tests showed that the new table will result in very little effect on net premiums and reserves for this type of insurance.

Summary Rates of Crude Rates of Mortality Medical vs. Nonmedical

Average Age	Crude Mortality Rate (non-medical)	Crude Mortality Rate (medical)
22.5	0.00064	0.00019
27.5	0.00062	0.00057
32.5	0.00079	0.00078
37.5	0.00138	0.0011
42.5	0.00239	0.00179
47.5	0.00395	0.00404
52.5	0.00865	0.00902
57.5	0.01533	0.0138

Summary of data by number of policies

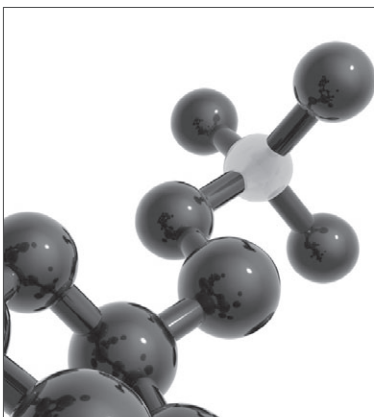
Age group	Exposure	Deaths
20-24	19695	8
25-29	44064	26
30-34	76518	60
35-39	104439	128
40-44	112197	230
45-49	96015	384
50-54	80564	714
55-59	49226	714

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Limited Life Expectancy to age 75 (ex:75-x)

x	Current				1986-1991
	Mortality Study	A49/52	A24/29	A67/70	Egyptian
10	58.4	58.0	55.5	59.4	58.1
20	48.7	48.6	46.5	49.7	48.6
30	39.0	39.1	37.6	40.0	38.9
40	29.2	29.6	28.5	30.4	29.3
50	20.0	20.4	19.8	21.0	20.1
60	11.7	12.0	11.6	12.4	11.9



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