

CONSTRUCTION OF LIFE TABLE FOR ASSAM FEMALES (1951-60)

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SUMMARY. In this paper, an attempt has been made to construct the life table of Assam Females for the period 1951-60.

1.0. INTRODUCTION

A life table reflects the course of mortality of a population. It has several fields of application. Among the many fields, the application of life tables in population projection, in life insurance and in other related demographic problems, is easily recognised by the students of population. In India the current practice is to present zonal life tables by the census actuary. In population projections at state level these life tables are often used, but the zones consist of heterogeneous populations with different demographic characteristics. This necessitates the construction of State Life Tables. As a type study the construction of Life Table for Assam Females (1951-60) has been considered in this paper.

1.1. *Age data.* The primary data required for the mortality investigation of a state based on the data of two censuses is the corrected age distribution of the population of the state during the two censuses. As there is practically no change in the boundary of Assam the graduated population figures (Assam Females) for 1951 and 1961 censuses^{1,2} are the basic data used in this analysis. They are presented in Table 1.

TABLE 1. GRADUATED AGE TABLES OF 1951 AND 1961 CENSUSES :
ASSAM FEMALES (in 00's)

age x	P_{51}^f	P_{61}^f	age x	P_{51}^f	P_{61}^f	age x	P_{51}^f	P_{61}^f
(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
0	1442	2601	25	771	840	50	235	284
1	1182	2394	26	748	825	51	223	271
2	1457	2234	27	721	805	52	211	258
3	1678	2101	28	693	785	53	199	246
4	1625	1938	29	665	760	54	188	235
5	1438	1800	30	636	745	55	178	223
6	1351	1700	31	607	718	56	168	212
7	1272	1716	32	579	687	57	159	201
8	1109	1030	33	550	658	58	150	190
9	1131	1568	34	521	629	59	141	180
10	1069	1504	35	494	600	60	133	169
11	1014	1444	36	469	570	61	123	159
12	964	1389	37	446	540	62	114	149
13	920	1338	38	424	510	63	105	139
14	878	1288	39	403	481	64	98	128
15	848	1230	40	382	454	65	88	118
16	825	1191	41	363	432	66	80	108
17	831	1145	42	345	412	67	73	98
18	830	1090	43	328	392	68	66	88
19	829	1055	44	312	374	69	59	78
20	828	1014	45	297	357	70	53	—
21	821	977	46	283	341			
22	808	943	47	270	325			
23	797	910	48	258	311			
24	789	877	49	246	297			

¹ Census of India, paper No. 2 of 1963, 1961 Census, Age Tables

² Census of India, Paper No. 3, 1954. Age Tables, 1951 Census.

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1.2. *Adjustment for migration.* The corrected age distribution presented in Table I above needs adjustment for migration during 1951-61. Here migration is studied on the basis of migrants classified according to duration of residence and only those migrants are considered whose duration of residence is less than 10 years. In case of in-migration to Assam² the figure has been estimated as 225,124 the bulk of which (67.5%) is from East Pakistan. For out-migration, number of out-migrants from Assam to East Pakistan has been taken as equal to number of in-migrants from East Pakistan to Assam. For out-migrants from Assam to other regions in India, the corresponding Census Volumes have been studied for migration data. For some of the states where the figures are not available, it has been estimated on the basis of the figures for neighbouring states or union territories. The amount of out-migration from Assam to countries different from India and Pakistan has been neglected since the extent of such out-migration is likely to be very small. After all these adjustments the volume of out-migration comes out to be 158,470. Thus the percentage of female out-migrants from Assam in 1951-61 in terms of 1951 Assam female population is 3.88% and percentage of total female in-migrants to Assam in 1951-61 in terms of 1961 Assam female population is 4.06%. The 1951 and 1961 Assam female population has been adjusted accordingly assuming the percentage to be the same for all age-groups and the adjusted population figures are presented in Table 2 below.

TABLE 2. ADJUSTED AGE TABLES OF 1951 AND 1961 CENSUSES
ASSAM FEMALES (in '00's)

age x	1951		age x	1961		age x	1951		age x	1961	
	adjusted for out- migration	adjusted for in- migration		adjusted for out- migration	adjusted for in- migration		adjusted for out- migration	adjusted for in- migration			
1	2	3	1	2	3	1	2	3	1	2	3
0	1286	2405	25	741	814	50	220	272			
1	1138	2297	26	719	792	51	214	260			
2	1400	2143	27	693	772	52	203	248			
3	1517	2016	28	666	753	53	191	236			
4	1466	1907	29	639	734	54	181	225			
5	1360	1813	30	611	715	55	171	214			
6	1299	1726	31	583	699	56	161	203			
7	1223	1646	32	556	679	57	153	193			
8	1182	1572	33	529	651	58	144	182			
9	1087	1504	34	501	603	59	136	173			
10	1027	1443	35	475	576	60	128	162			
11	976	1385	36	451	547	61	118	152			
12	927	1333	37	420	518	62	110	143			
13	884	1284	38	408	489	63	101	133			
14	844	1236	39	387	461	64	92	123			
15	815	1189	40	367	436	65	84	113			
16	803	1143	41	349	414	66	77	104			
17	799	1098	42	332	395	67	70	94			
18	798	1064	43	315	376	68	63	84			
19	797	1012	44	300	359	69	57	75			
20	796	973	45	285	342	70	51	—			
21	789	937	46	272	327						
22	777	905	47	260	312						
23	766	873	48	248	298						
24	755	841	49	238	285						

² Census of India, 1961, Vol. III, Part II—C.

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1.3. *Adjustment of 1951 population for age group 0-4.* Since the population figure in 1951 for age group 0-4 is ungraduated, the next task is to obtain graduated figures for age group 0-4 and then for individual ages. To obtain the graduated population figures for 1951 for the age group 0-4 by individual ages, the average increase in female population for age groups 5-9, 10-14 and 15-19 have been estimated and by backward projection the graduated age distribution for the age group 0-4 in 1951 has been estimated from that of 1961, assuming this average rate of increase to be applicable for the age group 0-4. The results are presented in the table below.

TABLE 3. ESTIMATION OF GRADUATED POPULATION IN 1951
AGE-GROUP 0-4

age group	1951 population in the age group	1961 population in the age group	percentage increase	average percentage increase	estimated population
(1)	(2)	(3)	(4)	(5)	(6)
0-4	6905	10858			7849
5-9	6141	8262	34.54	} 38.33	
10-14	4657	6680	43.44		
15-19	4011	5498	37.02		

Now assuming percentage age distribution in 1951 to be the same as that of 1961 for the age group 0-4, 7849 persons are distributed in individual ages as follows :

$$P_x^{51} = \frac{P_x^{61} \times 7849}{10858}, P_x^{61} \text{ being the population aged } x \text{ l.b.d. at time } t$$

for $x = 0, 1, 2, 3, 4$.

The figures are given in Table 4 below :

TABLE 4. ADJUSTED POPULATION FOR 1951

age x last birth day	population aged x l.b.d. in 1961	estimated population aged x l.b.d. in 1951
(1)	(2)	(3)
0	2495	1804
1	2297	1660
2	2143	1549
3	2016	1487
4	1907	1378
total	10858	7848

2.0. *Theory.* The method of construction* of life table for Assam Females 1951-60 has been based on corrected age distribution for 1951 and 1961 adjusted for migration figures. In our discussion we will consider female population only. The deaths occurring in the decennial interval 1951-60 may be divided into two classes :

- (1) Deaths of persons who were alive at the first census.
- (2) Deaths of persons who were born during 1951-60.

* Method of Using Census Statistics. Population Studies No. 7, United Nations.

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The first class is given by the difference of the population enumerated in 1951 and those aged 10 and above in 1961. The second class is given by the difference between the number of live births during the inter-censal period and the number of survivors out of them at the second census. To eliminate the effect of age bias, the age data have been considered in quinary age groups.

Assuming the age distribution of deaths in the actual population to be proportional to that in a standard life table the deaths have been allocated to individual ages. Special methods have however been adopted for age 0 and for advanced ages.

2.1. *Description of the method: working formula and notations used.* The following symbols have been used in the formulas of this chapter :

x = age last birth day (l.b.d.) or exact age as specified,

z = census date,

P_x^z = population aged x l.b.d. on the census date z ,

$D_x^{(1)}$ = average annual number of deaths, during the period ' $z-z+10$ ', aged x l.b.d. at death, who were alive on the census date z ,

$D_x^{(2)}$ = average annual number of deaths during the two decennial censuses ' $z-z+10$ ', aged x l.b.d. at death out of live-births during the inter-censal period,

D_x = average annual number of deaths during the inter-censal period who were aged x l.b.d. at death

$$\therefore D_x = D_x^{(1)} + D_x^{(2)}$$

${}_4P_x^z$ = Population aged x to $x+4$ (l.b.d.) on the census date z ,

$$\therefore {}_4P_x^z = \sum_{t=0}^4 P_{x+t}^z$$

${}_4L_x$ = Standard life table population in the age group x to $x+4$,

B^l = number of births (female) during the l -th year following the first census date,

P^l = Estimated average population during the l -th year following the first census date, ($l = 0, 1, 2, \dots, 9$).

Three different methods have been used for the derivation of mortality rates for different age groups. The whole body of the life table has been sub-divided as

(a) ages 1 to 60

(b) ages above 60

(c) age 0.

(a) *Ages 1 to 60* : The basic formula is given as :

$$P_x^z - P_{x+10}^{z+10} = \frac{1}{2} (D_x^{(1)} + D_{x+10}^{(1)}) + \sum_{t=1}^9 D_{x+t}^{(2)}$$

$$\begin{aligned} {}_4P_x^z - {}_4P_{x+10}^{z+10} &= \frac{1}{2} \left[\sum_{t=0}^4 D_{x+t}^{(1)} + \sum_{t=0}^4 D_{x+t+10}^{(1)} \right] + \sum_{t=0}^4 \sum_{s=1}^9 D_{x+t+s}^{(2)} \\ &= 0.5(D_x^{(1)} + D_{x+10}^{(1)}) + 1.5(D_{x+1}^{(1)} + D_{x+11}^{(1)}) \\ &\quad + 2.5(D_{x+2}^{(1)} + D_{x+12}^{(1)}) + 3.5(D_{x+3}^{(1)} + D_{x+13}^{(1)}) \\ &\quad + 4.5(D_{x+4}^{(1)} + D_{x+14}^{(1)}) + 5.0 \left(\sum_{t=0}^4 D_{x+t+5}^{(2)} \right) \quad \dots (i) \end{aligned}$$

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Assuming the age distribution of deaths to be proportional to that in a standard life table (the standard life table has been chosen as 1951 East Zono Life Table, Females)⁴.

Let
$$h = \frac{P_x^t - P_{x+10}^{t+10}}{L_x - L_{x+10}} \quad x = 0, 5, 10, \dots, 55.$$

It is easily observed that $L_x - L_{x+10}$ will give a similar expression as the in (i) where $D_x^{(1)}$ is to be replaced by the corresponding number of deaths d_x in the standard life table.

$\therefore h d_x = D_x^{(1)}$

Again
$$B^t - P_{x-4}^{t+10} = \sum_{x=0}^{x-4} D_x^{(2)} + \frac{1}{2} D_{x-4}^{(2)} \quad (t = 0, 1, 2, \dots, 8)$$

and $B^0 - P_0^{10} = K D_0^{(2)}$ where K has been estimated from the standard life table by using the relationship $l_0 - L_0 = K d_0$ (l_0 being the radix of the life table)

Let
$$h' = \frac{B^t - P_{x-4}^{t+10}}{l_0 - L_{x-4}}$$

$\therefore h' d_x = D_x^{(2)}$

Thus the complete age distribution of intercensal deaths by years of age has been obtained. From the knowledge of the age distribution of deaths the average annual number of deaths within each age group during the intercensal period 1951-61 has been obtained. The average population within each age group ($x-z+1$) of the decennial period (P_x) has been taken as $\frac{P_x^1 + P_x^t}{2}$ and hence the central rate of mortality m_x and the annual rate of mortality q_x have been obtained in the usual way.

For the calculation of B^t the following method has been adopted. The crude female birth rate (female births in terms of female population)⁵ has been taken to be 49.3 during the period 1951-61. P^t is obtained as

$$P^t = P^{01}(1+r)^{t+0.5} \text{ where } P^{01} = P^{01}(1+r)^{0.5}$$

($t = 0, 1, 2, \dots, 9$).

The results are shown in Table 5 below :

TABLE 5. ESTIMATED NUMBER OF BIRTHS FOR DIFFERENT YEARS

year	mid-year female population in 00's	births (female) in 00's
(1)	(2)	(3)
1951	41225	2032
1952	42350	2088
1953	42841	2112
1954	44092	2203
1955	45911	2283
1956	47163	2326
1957	48032	2368
1958	49772	2554
1959	51129	2521
1960	52524	2589

⁴ Census of India, Paper No. 2, 1951 Life Tables, 1951 Census.

⁵ Census of India, 1961. Census Life Tables 1951-60.

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The q_x values were plotted in a graph paper. The shape of the mortality curve was found out to be satisfactory excepting for the age range 40-60. The irregularities in that portion were removed by hand polishing in the light of our experience regarding the shape of mortality curve in under-developed countries. The irregularities in the rates of mortality at higher ages might be due to the following reasons.

(i) The assumption that the age distribution of deaths in an actual population in quinquennial age groups is the same as that of the standard life table may not be justified, particularly for higher ages.

(ii) Migration may be age and sex selective.

(iii) In spite of all the adjustments made by the Census Actuaries in the correction of the age data, the figures may not be quite satisfactory, particularly for higher ages.

However the graduated rates of mortality (q_x) are expected to be in conformity with the rates of mortality expected to be observed in similar under developed countries.

(b) Ages above 60 : To derive values of q_x for ages beyond 60 in the construction of life tables for 1951-60 the Gompertz curve was used as a graduation formula. However, Gompertz curve was found to be unsatisfactory for our life table. Makeham's graduation formula in the form $\log_e p_x = A + BC^x$ was found to be satisfactory for graduating rates of mortality for ages beyond 60. The original rates of p_x at ages 45, 50, 55 and 60 were used for the purpose of graduation. The original values of q_x between 45 and 60 fitted well with the graduated values from the Makeham's curve and as such the smoothness at the junction was not disturbed.

(c) Age 0 : The ratio of crude death rate of Assam to that of East Zone* was taken to be the same as the ratio of q_0 of Assam Females to that of East Zone Females. The following figures were used.

Crude death rate of Assam : 26.9

Crude death rate of East Zone : 23.9

$$q_0(\text{East zone}) = 0.12820$$

Estimated q_0 for Assam Females is taken as

$$q_0 = \frac{0.12820 \times 26.9}{23.9} = 0.1443$$

2.2. *The Construction* : Having obtained the q_x values for all ages, the life table was constructed in the usual way (Table 6). For actual construction of Life Table, computation was done in IBM 1401 EDPM by using FORTRAN II.

2.3. *Discussion of the result* : The results are subject to the limitation caused by the assumption that net migration being small, its effect on the age distribution was negligible, especially as female migration was more likely to be of the nature of family migration than males. In fact, immigrants and emigrants could have different age-distributions and so needed separate treatments. Further, the female migration might not have been wholly of the nature of family migration so that to the extent it differed from the latter, its effect on the age distribution needed to be considered especially at the early infant and old ages. It will be seen, however, that it has not been possible to adjust for migration on the above lines and that the simplifying assumption mentioned above has had to be made, because of the absence of adequate data. To see how far the life table for Assam Female obtained by

* See footnote 8

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TABLE 6. ASSAM—FEMALES LIFE TABLE (1951-60)

age	central rate of mortality at age x	probability of dying between ages x and $x+1$	probability of surviving from age x to $x+1$	deaths between ages x and $x+1$	survivors to exact age x	number living between ages x and $x+1$	number living above age x	expectation of life at age x
x	m_x	q_x	p_x	d_x	l_x	L_x	T_x	e_x^0
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	0.1618	0.1443	0.8557	1443	10000	8918	364470	36.45
1	0.0429	0.0420	0.9580	359	8557	8378	355552	41.65
2	0.0289	0.0286	0.9716	234	8198	8081	347174	42.35
3	0.0188	0.0186	0.9814	148	7964	7890	339003	42.58
4	0.0153	0.0152	0.9848	119	7816	7756	331203	42.38
5	0.0135	0.0134	0.9866	103	7697	7646	323447	42.02
6	0.0128	0.0127	0.9873	96	7594	7548	315801	41.58
7	0.0129	0.0128	0.9872	96	7498	7450	308255	41.11
8	0.0126	0.0125	0.9875	93	7402	7355	300805	40.84
9	0.0122	0.0121	0.9879	88	7309	7265	293460	40.16
10	0.0113	0.0112	0.9888	81	7221	7180	286883	39.63
11	0.0100	0.0100	0.9900	71	7140	7104	279005	39.06
12	0.0087	0.0087	0.9913	62	7069	7038	271901	38.46
13	0.0076	0.0076	0.9924	53	7007	6980	265483	37.80
14	0.0068	0.0068	0.9934	46	6954	6931	258783	37.08
15	0.0057	0.0057	0.9943	39	6908	6888	252082	36.33
16	0.0048	0.0048	0.9952	33	6869	6852	244064	35.53
17	0.0040	0.0040	0.9960	27	6836	6822	237212	34.70
18	0.0034	0.0034	0.9966	23	6800	6798	230390	33.84
19	0.0029	0.0029	0.9971	20	6780	6776	223692	32.95
20	0.0030	0.0030	0.9970	20	6766	6750	216816	32.04
21	0.0039	0.0039	0.9961	26	6746	6733	210090	31.14
22	0.0049	0.0049	0.9951	33	6720	6704	203327	30.26
23	0.0060	0.0060	0.9940	40	6687	6667	196623	29.40
24	0.0074	0.0074	0.9928	49	6647	6622	189958	28.58
25	0.0092	0.0092	0.9908	61	6598	6568	183334	27.79
26	0.0114	0.0113	0.9887	74	6537	6500	176765	27.04
27	0.0138	0.0137	0.9863	89	6463	6418	170266	26.34
28	0.0166	0.0165	0.9835	105	6374	6322	163848	25.70
29	0.0198	0.0196	0.9804	123	6269	6208	157525	25.13

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TABLE 6. ASSAM—FEMALES LIFE TABLE (1951-60)—Contd.

age	central rate of mortality at age x	probability of dying between ages x and $x+1$	probability of surviving from age x to $x+1$	months between ages x and $x+1$	survivors to exact age x	number living between ages x and $x+1$	number living above age x	Expectation of life at age x
x	m_x	q_x	p_x	d_x	l_x	L_x	T_x	e_x^0
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
30	0.0212	0.0210	0.9790	129	6146	6082	161318	24.62
31	0.0231	0.0228	0.9772	137	6017	5948	148236	24.14
32	0.0245	0.0230	0.9761	141	5880	5810	136288	23.69
33	0.0250	0.0247	0.9753	142	5730	5668	124478	23.26
34	0.0257	0.0254	0.9746	142	5597	5526	112810	22.84
35	0.0261	0.0258	0.9742	141	5465	5384	102284	22.42
36	0.0266	0.0263	0.9737	140	5314	5244	110000	22.00
37	0.0271	0.0267	0.9733	138	5174	5105	111856	21.58
38	0.0276	0.0272	0.9728	137	5036	4968	106551	21.16
39	0.0279	0.0276	0.9725	136	4890	4832	101583	20.74
40	0.0284	0.0280	0.9720	133	4764	4698	96751	20.31
41	0.0288	0.0284	0.9716	132	4631	4565	92053	19.88
42	0.0291	0.0287	0.9713	129	4499	4434	87488	19.45
43	0.0296	0.0292	0.9708	128	4370	4300	83054	19.00
44	0.0299	0.0296	0.9705	125	4242	4180	78748	18.56
45	0.0304	0.0300	0.9700	124	4117	4055	74568	18.11
46	0.0309	0.0304	0.9696	121	3993	3932	70613	17.66
47	0.0313	0.0308	0.9692	119	3872	3812	66581	17.20
48	0.0317	0.0312	0.9688	117	3753	3694	62769	16.72
49	0.0322	0.0317	0.9683	116	3636	3578	59075	16.25
50	0.0329	0.0324	0.9679	114	3521	3464	55497	15.76
51	0.0338	0.0332	0.9668	113	3407	3350	52033	15.27
52	0.0346	0.0340	0.9660	112	3294	3238	48683	14.78
53	0.0355	0.0349	0.9651	111	3182	3126	45445	14.28
54	0.0366	0.0360	0.9641	110	3071	3016	42319	13.78
55	0.0377	0.0370	0.9630	110	2961	2906	39303	13.27
56	0.0390	0.0383	0.9617	109	2851	2796	36397	12.77
57	0.0408	0.0398	0.9602	109	2742	2688	33601	12.25
58	0.0425	0.0416	0.9584	110	2633	2578	30913	11.74
59	0.0446	0.0437	0.9563	110	2523	2468	28335	11.23

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TABLE 6. ASSAM—FEMALES LIFE TABLE (1951-60)—Contd.

a_{50}	central rate of mortality at age x	probability of dying between ages x and $x+1$	probability of surviving from age x to $x+1$	deaths between ages x and $x+1$	survivors to exact age x	number living between ages x and $x+1$	number living above age x	expectation of life at age x
x	m_x	q_x	p_x	d_x	l_x	L_x	T_x	e_x^0
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
60	0.0472	0.0461	0.9539	111	2413	2358	25867	10.72
61	0.0499	0.0487	0.9513	112	2302	2246	25509	10.21
62	0.0531	0.0517	0.9483	113	2190	2134	25263	9.71
63	0.0566	0.0553	0.9444	115	2077	2020	24929	9.21
64	0.0609	0.0591	0.9409	116	1965	1904	24709	8.72
65	0.0657	0.0636	0.9364	117	1846	1788	24505	8.24
66	0.0706	0.0682	0.9318	118	1729	1670	24317	7.76
67	0.0773	0.0744	0.9256	120	1611	1551	24147	7.29
68	0.0844	0.0810	0.9190	121	1491	1430	24006	6.84
69	0.0925	0.0884	0.9118	121	1370	1310	23866	6.40
70	0.1017	0.0968	0.9032	121	1249	1188	23736	5.97
71	0.1124	0.1064	0.8936	120	1128	1068	23618	5.56
72	0.1243	0.1172	0.8828	118	1008	949	23500	5.16
73	0.1384	0.1294	0.8706	115	890	832	23381	4.78
74	0.1541	0.1431	0.8569	111	775	720	23249	4.41
75	0.1723	0.1586	0.8414	105	664	612	23099	4.06
76	0.1929	0.1759	0.8241	98	559	510	22927	3.73
77	0.2164	0.1953	0.8047	90	461	416	22727	3.42
78	0.2434	0.2170	0.7830	80	371	331	22491	3.13
79	0.2740	0.2410	0.7590	70	291	256	22200	2.85
80	0.3089	0.2676	0.7324	60	221	192	21854	2.60
81	0.3485	0.2968	0.7052	48	162	138	21452	2.36
82	0.3936	0.3289	0.6711	37	114	96	20994	2.14
83	0.4445	0.3637	0.6363	28	77	63	20478	1.92
84	0.5022	0.4014	0.5986	20	49	39	19903	1.73
85	0.5671	0.4418	0.5582	12.8	29.3	22.9	19278	1.58
86	0.6396	0.4846	0.5154	8.0	16.5	12.5	18603	1.41
87	0.7203	0.5296	0.4704	4.5	8.5	6.2	17878	1.27
88	0.8001	0.5762	0.4238	2.3	4.0	2.8	17103	1.16
89	0.9068	0.6239	0.3761	1.1	1.7	1.2	16278	1.06
90	0.0363	0.6720	0.3280	0.43	0.64	0.42	15403	0.92
91	0.0617	0.7194	0.2806	0.15	0.21	0.13	14478	0.81
92	0.0824	0.7654	0.2346	0.05	0.06	0.04	13503	0.67
93	0.0976	0.8088	0.1912	0.01	0.01	—	12578	—

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our method compares with that obtained by the Census Actuary for East Zone (which includes Assam besides Bihar, Orissa and West Bengal) Life Table Female (1951-60), expectation of life starting from age 0 to 60 at intervals of 5 years are presented in a tabular form.

TABLE 7. EXPECTATION OF LIFE AT DIFFERENT AGES AT INTERVALS OF 5 YEARS

age x	expectation of life at age x (female) in 1951-60	
	east zone e_x^E (E.Z.)	Assam e_x^A (Assam)
(1)	(2)	(3)
0	40.05	36.45
5	46.14	42.02
10	43.06	39.63
15	38.91	36.33
20	34.99	32.04
25	31.01	27.79
30	27.22	24.62
35	24.28	22.42
40	22.06	20.31
45	19.86	18.11
50	17.61	16.76
55	15.32	13.27
60	13.21	10.72

It appears from the above table that mortality of Assam female was heavier than that of East Zone females. It is corroborated by the fact that death rate of Assam in 1941-50 was higher than that of Bihar, Orissa and West Bengal, as also in 1951-60 (S. P. Jain—State growth rates and their components⁷). Further, in the same paper, e_0^E for Assam (male and female combined) is 36.8 which is close to 36.45 for Assam females as found in our study, but is slightly greater, presumably because of the higher life expectancy of males in Assam as in All-India.

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⁷ State growth rates and their components.—S. P. JAIN. All India Seminar on Population, 1964. (Institute of Economic Growth, Delhi)

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