

# Construction of Abridged Life Tables for Districts in India:

## Using UNCOMBIN of MORTPAK- LITE

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### Extended Abstract

United Nations suggested a program "UNCOMBIN" to calculate a "model" life table from an estimate of life expectancy at age 20 combined with an estimate of survivorship to age 1, survivorship to age 5, or both. In the present study an attempt is made at first to estimate LE(20) indirectly from an estimate of the Infant mortality rate (IMR). These IMR values have been obtained from the 2009 report of the Registrar General of India on "District Level Estimates of Child Mortality in India Based on the 2001 Census Data. The above reports states that these IMR values are obtained using the Brass method and using the U.N. South Asian Pattern as it is the most commonly accepted pattern for India. So when using the UNCOMBIN also UN South Asian Pattern of the Model Life Tables is used. IMR is at first converted into  $l_1$  as  $l_1$  is one of the inputs. No attempt is made to consider the other input  $l_5$  here as it is not a mandatory. LE(20) values of Both Sexes Combined, Males and Females are calculated using the following regression models:

Both Sexes:  $LE(20) = 55.105328 - 71.184 * IMR$ ,  $R = .793$ ;  $R^2 = .628$ ;  $Adj R^2 = .627$ ;  $SEE = 1.840$ ;  $F = 508.813$ ;  $N = 303$ .  
(202.695) (-22.557)

Males:  $LE(20) = 53.03461 - 60.01912 * IMR$ ,  $R = .773$ ;  $R^2 = .597$ ;  $Adj R^2 = .596$ ;  $SEE = 1.632$ ;  $F = 446.357$ ;  $N = 303$ .  
(216.552) (-21.127)

Females:  $LE(20) = 56.92699 - 78.01446 * IMR$ ,  $R = .751$ ;  $R^2 = .564$ ;  $Adj R^2 = .563$ ;  $SEE = 2.369$ ;  $F = 389.964$ ;  $N = 303$ .  
(166.759) (-19.748)

The above models were developed using 303 state level life tables of India that refer to various time periods.

Various parameters present along with the regression models clearly shows their usefulness in estimating the LE(20) from the only information on IMR.

Table 1 below presents the input ( $l_1$  and  $e(20)$ ) and the main output of the life table  $e(0)$  for all the districts and Punjab as a whole for the census year 2001 as the input on IMR refer to 2001 census. IMR is obtained using the children everborn and children surviving data of the 2001 census and the Brass technique further explained in Registrar General of India report "District Level Estimates of Child Mortality in India Based on the 2001 Census Data." As an illustration 3 detailed tables with  $l_x$  and  $e_x$  column of the life table of Punjab, Gurdaspur and Amritsar are presented by region and sex.

The above results presented in Table 1 clearly indicates that the present methodology is well suited for obtaining reliable life tables for districts in India when the given information is only the estimate of IMR.

The study thus concludes that UN COMBIN may be used for estimating district or other units of below state level in India when in need.

(NOTE: The present author is happy to inform that he has already estimated life tables for all districts in India using the COMBIN and presented the same in a compact format as shown for the district Amritsar. He is in the process of publishing the same as BOOK.)



PUNJAB

Table 1: ABRIDGED LIFE TABLES BY SEX AND RESIDENCE,PUNJAB -2001

Age x	Total-Total		Total-Male		Total-Female		Rural-Total		Rural-Male		Rural-Female		Urban-Total		Urban-Male		Urban-Female	
	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)
0	100000	64.590	100000	63.862	100000	64.323	100000	63.850	100000	63.349	100000	63.318	100000	66.061	100000	65.220	100000	66.121
1	94300	67.482	94800	66.354	93700	67.632	93900	66.983	94500	66.024	93200	66.919	95100	68.455	95600	67.214	94600	68.884
5	92174	65.004	92940	63.652	90680	65.837	91545	64.669	92476	63.437	89843	65.366	93407	65.669	94154	64.223	92152	66.675
10	91403	60.531	92001	59.277	89794	61.461	90733	60.225	91506	59.083	88901	61.032	92716	61.139	93295	59.791	91363	62.230
15	91039	55.763	91551	54.556	89425	56.705	90353	55.468	91045	54.370	88508	56.293	92383	56.351	92875	55.051	91036	57.444
20	90554	51.048	90924	49.914	88920	52.012	89852	50.763	90409	49.734	87968	51.622	91928	51.617	92271	50.394	90590	52.714
25	90029	46.331	90288	45.248	88298	47.360	89305	46.058	89758	45.076	87305	46.994	91444	46.877	91674	45.706	90038	48.021
30	89379	41.649	89507	40.620	87593	42.721	88630	41.389	88959	40.458	86557	42.378	90845	42.169	90939	41.054	89407	43.342
35	88580	37.001	88547	36.032	86724	38.123	87800	36.756	87978	35.880	85640	37.804	90106	37.493	90035	36.440	88622	38.703
40	87451	32.444	87210	31.544	85627	33.578	86631	32.216	86615	31.403	84491	33.283	89054	32.905	88768	31.922	87617	34.117
45	85752	28.034	85238	27.212	84154	29.120	84880	27.825	84609	27.084	82963	28.848	87455	28.457	86883	27.557	86242	29.619
50	83138	23.831	82273	23.096	82088	24.786	82204	23.644	81606	22.982	80836	24.536	84968	24.211	84023	23.404	84287	25.244
55	78981	19.945	77677	19.305	78831	20.698	77975	19.781	76969	19.206	77506	20.476	80958	20.278	79541	19.572	81171	21.110
60	72890	16.389	71114	15.842	73778	16.932	71819	16.249	70374	15.758	72367	16.739	75007	16.675	73071	16.070	76284	17.290
65	63980	13.305	61737	12.849	66102	13.591	62868	13.188	60986	12.780	64613	13.430	66196	13.544	63735	13.039	68768	13.889
70	52468	10.655	49877	10.291	55540	10.677	51364	10.561	49153	10.235	54034	10.547	54688	10.847	51820	10.442	58269	10.919
75	38822	8.509	36170	8.234	42113	8.261	37814	8.438	35531	8.192	40701	8.161	40873	8.654	37901	8.348	44712	8.447
80	25173	6.786	22883	6.592	27412	6.353	24368	6.736	22391	6.563	26245	6.284	26834	6.888	24229	6.672	29600	6.481
85	13775	5.418	12190	5.286	14468	4.879	13244	5.384	11878	5.266	13706	4.833	14885	5.487	13053	5.341	15929	4.964

## GURDASPUR

Table 1: ABRIDGED LIFE TABLES BY SEX AND RESIDENCE, PUNJAB -2001

Age x	Total-Total		Total-Male		Total-Female		Rural-Total		Rural-Male		Rural-Female		Urban-Total		Urban-Male		Urban-Female	
	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)
0	100000	65.143	100000	64.543	100000	65.124	100000	64.959	100000	64.203	100000	64.724	100000	66.244	1E+05	65.220	100000	66.519
1	94600	67.850	95200	66.788	94100	68.193	94500	67.728	95000	66.572	93900	67.913	95200	68.575	95600	67.214	94800	69.156
5	92640	65.254	93551	63.938	91340	66.211	92485	65.171	93247	63.796	91011	66.024	93559	65.751	94154	64.223	92473	66.860
10	91900	60.759	92653	59.534	90498	61.803	91735	60.683	92328	59.406	90147	61.632	92878	61.215	93295	59.791	91705	62.400
15	91547	55.984	92218	54.803	90147	57.034	91379	55.910	91885	54.680	89788	56.869	92548	56.424	92875	55.051	91386	57.608
20	91074	51.261	91603	50.154	89669	52.324	90902	51.190	91265	50.034	89296	52.168	92097	51.688	92271	50.394	90954	52.870
25	90565	46.535	90986	45.476	89079	47.654	90387	46.467	90639	45.362	88690	47.507	91618	46.945	91674	45.706	90417	48.169
30	89934	41.843	90228	40.837	88407	42.996	89750	41.778	89869	40.728	88002	42.858	91024	42.234	90939	41.054	89801	43.481
35	89158	37.185	89296	36.236	87576	38.380	88966	37.123	88923	36.134	87152	38.251	90293	37.555	90035	36.440	89034	38.834
40	88058	32.616	87995	31.733	86520	33.816	87856	32.559	87604	31.638	86076	33.697	89251	32.962	88768	31.922	88049	34.239
45	86396	28.192	86066	27.384	85091	29.340	86182	28.139	85653	27.298	84624	29.230	87665	28.510	86883	27.557	86696	29.732
50	83829	23.973	83153	23.249	83074	24.988	83600	23.925	82714	23.173	82582	24.886	85193	24.259	84023	23.404	84766	25.348
55	79727	20.068	78614	19.438	79879	20.880	79479	20.027	78146	19.371	79357	20.789	81202	20.320	79541	19.572	81682	21.203
60	73687	16.495	72096	15.955	74898	17.090	73422	16.460	71606	15.898	74339	17.011	75269	16.711	73071	16.070	76834	17.372
65	64811	13.393	62737	12.943	67289	13.722	64534	13.364	62237	12.896	66696	13.656	66471	13.574	63735	13.039	69357	13.957
70	53298	10.726	50847	10.366	56750	10.783	53021	10.702	50362	10.328	56144	10.730	54967	10.872	51820	10.442	58878	10.974
75	39585	8.562	37031	8.290	43260	8.343	39330	8.544	36599	8.262	42685	8.301	41133	8.672	37901	8.348	45299	8.490
80	25787	6.823	23550	6.632	28370	6.409	25582	6.811	23215	6.612	27888	6.381	27047	6.901	24229	6.672	30101	6.510
85	14182	5.444	12616	5.313	15103	4.916	14045	5.435	12401	5.300	14783	4.897	15028	5.496	13053	5.341	16270	4.984

## AMRITSAR

Table 1: ABRIDGED LIFE TABLES BY SEX AND RESIDENCE, PUNJAB -2001

Age	Total-Total		Total-Male		Total-Female		Rural-Total		Rural-Male		Rural-Female		Urban-Total		Urban-Male		Urban-Female		
	x	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)	l(x)	e(x)		
0		100000	65.143	100000	64.712	100000	64.523	100000	64.220	100000	63.862	100000	63.318	100000	66.792	100000	66.061	100000	66.718
1		94600	67.850	95300	66.895	93800	67.773	94100	67.233	94800	66.354	93200	66.919	95500	68.931	96100	67.736	94900	69.292
5		92640	65.254	93703	64.010	90846	65.930	91860	64.836	92940	63.652	89843	65.366	94011	65.999	94894	64.577	92633	66.952
10		91900	60.759	92814	59.599	89971	61.547	91069	60.378	92001	59.277	88901	61.032	93359	61.443	94085	60.111	91875	62.484
15		91547	55.984	92383	54.865	89607	56.787	90697	55.615	91551	54.556	88508	56.293	93040	56.645	93682	55.359	91561	57.690
20		91074	51.261	91771	50.214	89108	52.090	90204	50.905	90924	49.914	87968	51.622	92600	51.902	93091	50.694	91134	52.948
25		90565	46.535	91159	45.534	88495	47.433	89668	46.194	90288	45.248	87305	46.994	92136	47.150	92518	45.992	90605	48.242
30		89934	41.843	90407	40.891	87798	42.790	89006	41.518	89507	40.620	86557	42.378	91560	42.431	91811	41.327	89997	43.551
35		89158	37.185	89482	36.287	86939	38.187	88191	36.878	88547	36.032	85640	37.804	90851	37.741	90941	36.697	89239	38.899
40		88058	32.616	88189	31.780	85852	33.637	87042	32.330	87210	31.544	84491	33.283	89837	33.137	89718	32.161	88264	34.300
45		86396	28.192	86271	27.427	84389	29.175	85317	27.929	85238	27.212	82963	28.848	88288	28.671	87888	27.775	86922	29.788
50		83829	23.973	83372	23.288	82335	24.836	82672	23.737	82273	23.096	80836	24.536	85864	24.405	85094	23.598	85005	25.400
55		79727	20.068	78846	19.471	79094	20.743	78478	19.862	77677	19.305	77506	20.476	81930	20.448	80687	19.742	81937	21.250
60		73687	16.495	72340	15.984	74059	16.971	72355	16.318	71114	15.842	72367	16.739	76053	16.822	74281	16.215	77108	17.412
65		64811	13.393	62987	12.967	66399	13.623	63423	13.246	61737	12.849	64613	13.430	67299	13.666	64979	13.159	69652	13.992
70		53298	10.726	51090	10.385	55842	10.703	51914	10.608	49877	10.291	54034	10.547	55805	10.946	53040	10.539	59183	11.002
75		39585	8.562	37248	8.305	42399	8.281	38315	8.473	36170	8.234	40701	8.161	41918	8.728	39000	8.421	45594	8.511
80		25787	6.823	23718	6.642	27649	6.367	24767	6.760	22883	6.592	26245	6.284	27692	6.940	25095	6.724	30354	6.525
85		14182	5.444	12724	5.320	14625	4.888	13506	5.401	12190	5.286	13706	4.833	15467	5.523	13616	5.376	16442	4.994