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Mohamed, Aida Sayed	:المؤلف الرئيسي
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SEASONAL VARIATION IN VITAL STATISTICS IN RURAL OF BEHERA GOVERNORATE

1.1: Importance of the study

Seasonal variation in the reproductive cycle of most living things are commonly observed as natural phenomenon. In the human being there are large seasonal variations in all vital events (births, deaths, marriage and divorce). Seasonal variations reflect to a significant degree the social, economic, demographic and environmental conditions of population (Loza, 1984). The need to study levels, trends and differentials in births, deaths, marriage and divorce has been realized increasingly by policy makers since world war.

Previous studies e.g (Salem et.al,1973) revealed seasonal patterns of deaths in A.R.E. by the main age groups, localities and causes of infant deaths and found that the peak of the proportions is for June, and lowest is for February. This is true for both total deaths and infant deaths.

Therefore, in formulating policies and designing programs aiming at improving the quality of human life, the seasonality in occurrence of vital events should be taken into consideration. Thus, the present paper aims to examine seasonal variations in the vital events.

By: Aida Sayed Mohamed

1.2: Objectives of the study:

This study aims at investigating the changes in births, deaths, marriage and divorce, by season in Behera governorate during the period (1987-1996).

1.3: Data sources:

The study relies on the vital statistics data which are published in the annual reports of births, deaths, marriage, and divorce and issued by Central Agency for Public Mobilization and Statistics.

The vital registration system is suffering from varying degree of under registration. However, misreporting of vital event is common feature in most developing countries. Vital statistics registration has shown in recent years a great improvement in reporting vital events. So, the present study will be based on official reports of births, deaths, marriage and divorce, statistics without modification of data, assuming that the under registration is distributed equally during the year.

1.4: Methodology:

Time series analysis during the period 1987-1996 by months is applied. The effect of the general trend was excluded by using the mathematical methods to calculate the seasonal index numbers, the

following equation was the base to calculate the index of change in the general trend.

$$Y = a t + c \text{ Where:}$$

y: refers to the value of the phenomenon

a: is the coefficient for the change in the general trend

t: refers to the time

Ordinary Least Square (OLS) method is used to calculate the coefficient of change in the general trend.

After obtaining the index of change in the general trend, the average monthly standard value for phenomenon was calculated. The effect of the general trend was excluded from the monthly standard value by subtracting the value of the general trend from the value of the phenomenon in January, subtracting twice the value of the general trend from the value of the phenomenon in February, subtracting three times the value of the general trend from the value of the phenomenon in March and so on. The mean of latter net standard numbers was calculated by summing these numbers and deviding by 12 which indicates the monthly events after excluding the general trend. This methodology has been applied on the vital events of El-Behera governorate.

1.5 Profile of Behera Governorate

El-Behera governorate is one of the Lower Egypt governorats. Its total area is 10129 K.M and the inhapited area is 4590 K.m which represents 13% of total inhapited area of Egypt. El-Behera governorate is

divided into 14 Markaz. The number of population in the governorate increased from 1.7 million in 1960 to 2.5 million in 1976, 3.2 million in 1986 and reached to 4 million in 1996 which represents 6.7% of total population of Egypt in 1996.

Illiteracy rate in the governorate decreased from 67.5% in 1976, to 57.8% in 1986. The illiteracy rate in rural Behera is higher (50.6%) compared to that in urban areas (30%) in 1996. The percent of population who participate in labour force constitute about 34% of the population of El-Behera aged 6+. Since El-Behera governorate is considered as rural governorate, there is about 61% of the working population are engaged in agriculture compared to about 10% in manufacture and 29% in the service sector. There is decrease in birth and death rates in the governorate, where birth rate decreased from 40 births per 1000 population in 1986 to 32.3% in 1989 and to 27.8% in 1993. Also, there is decrease in death rate from 9% to 7.4% and to 6.1% during the same reference period

1.6: Organization of the study:

This study will be organized in four sections. Following the introduction, seasonal variation in marriage and divorce in rural of Behera governorate will be examined in section two. Section three deals with seasonal variations of births and deaths in Rural Behera governorate. Finally summary of main findings and conclusion are presented in section four.

SECTION TWO

Seasonal variation in marriage and divorce

2.1: Marriage and Divorce

In this chapter an attempt will be made to study seasonality of marriage in Rural Behera governorate during the period 1987-1996 to show the extent of relationship that may exist between these demographic phenomena and prevailing customs, habits and other factors of temporal effect.

Marriage and divorce as social institutions are frequently affected by a set of customs and habits strongly observed in the society. The occurrence of such events is not likely to be equally distributed among different months of the year.

2.2: Seasonal variations in marriage

The seasonality of marriage is presented in table (1) and figure (1). As can be observed from the table under consideration, marriage is most prevalent in November and December. The seasonal percent is 128% in November and 126% in December. This may be associated with seasonality of agricultural crops, where rice is harvested in October, in Behera. July and August (120% each) followed by September (104%) have higher seasonal marriage proportion than other months. This may also be

associated with seasonality of agricultural crops, where sugar cane and cotton are harvested in August and September in Behera. On the other hand, the lowest seasonal proportion for marriage is observed in February (66%) then April (78%).

2.3: Seasonal variations in divorce

Divorce does not occur with the same level along the various months of the year. This part of the paper will investigate the seasonality of this event in rural Behera governorate. It appears from the analysis of the available data for rural Behera governorate that the highest percentage of divorce occurs in the month of September whereas the index reaches 171% second in ranking is the month of March 148% followed by December 144%. On the other hand, February and May score the lowest percentage with an index of 66%, followed by November 72%. (Table 2). Which may be attributed to the influence of income in this governorate.

Table (1)
Seasonal variation of Marriage contracts in Behera Governorate
(Rural) 1987-1996

Month	No. of marriage Contracts Standard year (Average 1987-1996)	Standard value after Excluding general trend	Seasonal percent
January	1822	1819	99
February	1220	1214	66
March	1679	1670	91
April	1446	1434	78
May	1537	1522	83
June	1700	1683	92
July	2219	2200	120
August	2230	2208	120
September	1928	1903	104
October	1739	1711	93
November	2389	2385	128
December	2357	2323	126
Average total	1856	1837	100

Coefficient of change in general trend = 3.150

Figure (1)
Seasonal variation in Marriage contracts in rural Behera Governorate
1987-1996

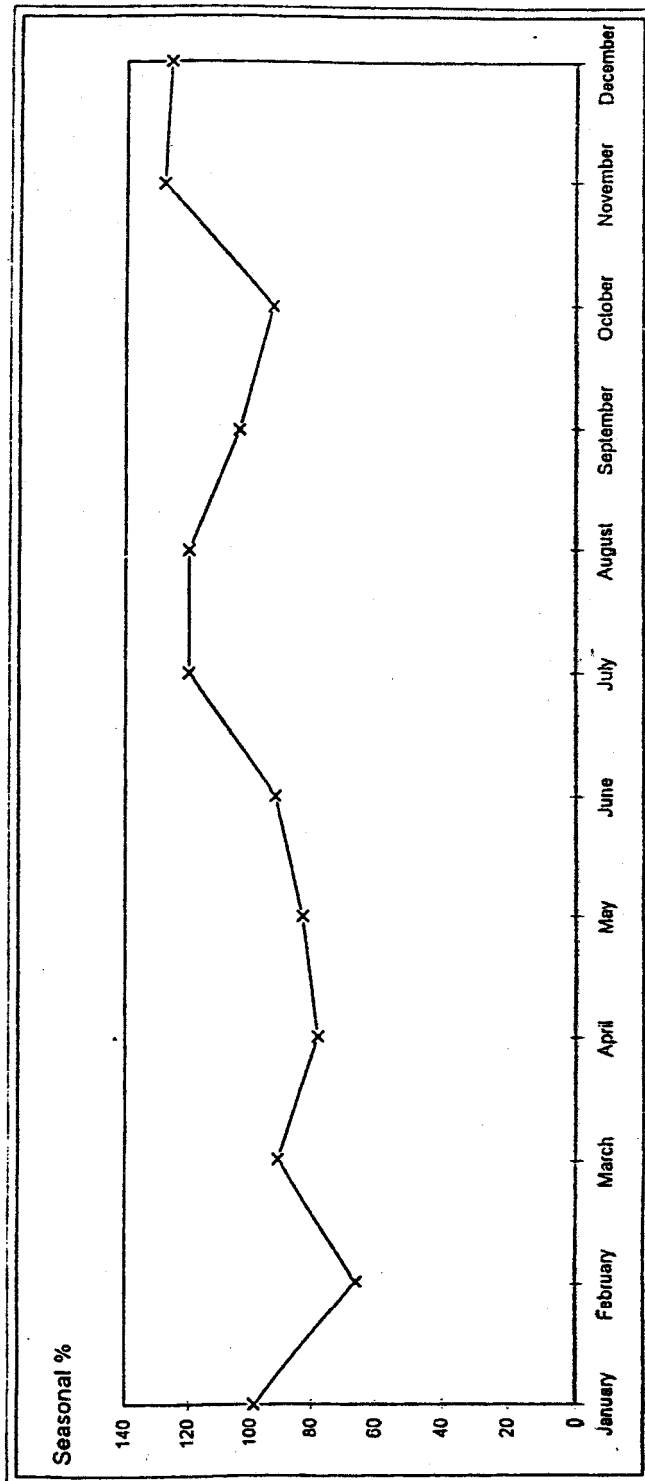
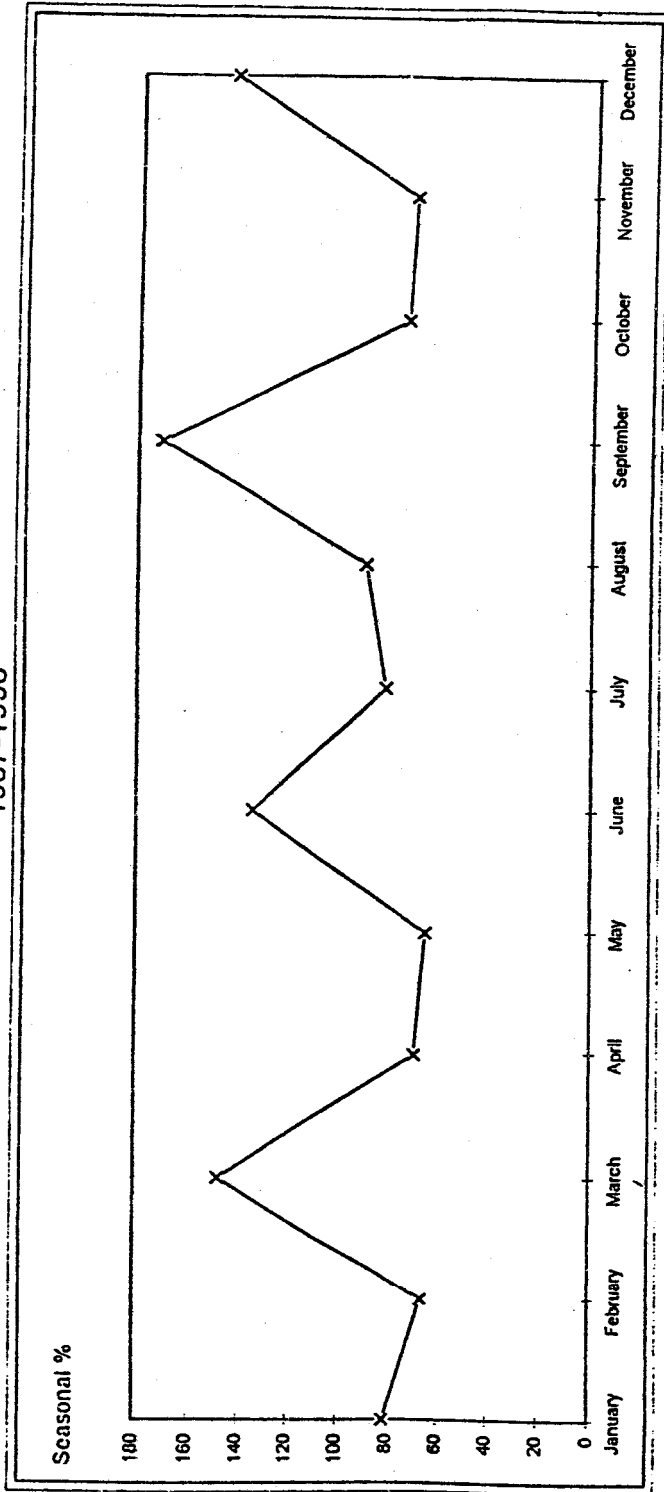


Table (2)
Seasonal variation in Divorce certificates in Rural Behera Governorate
1987-1996

Month	No. of Divorce Contract Standard year (Average 1987-1996)	Standard value after Excluding general trend	Seasonal percent
January	209	209	82
February	169	170	66
March	378	379	148
April	176	178	70
May	166	168	66
June	342	345	135
July	207	210	82
August	227	231	90
September	434	438	171
October	185	190	74
November	179	184	72
December	363	369	144
Average total	253	256	100

Coefficient of change in general trend = -0.46663

Figure (2)
Seasonal variation in Divorce certificates in rural Behera Governorate
1987-1996



SECTION THREE

Seasonal Variation in Births and Deaths

3.1: Births and Deaths

The aggregate fertility model of (1983) is described by the following equation Bongaarts and Potter. In this study we are interested with

$$TFR = C_m \times C_c \times C_a \times C_i \times TF$$

Where:

C_m is the index of marriage

This indicates the strong relationship between marriage prevalence and fertility. Therefore, seasonal variations of births can be correlated with those in marriage.

3.2: Seasonal variation in births in Behera governorate

It is clear from data of table (3) that occurrence of births is most prevalent in January where seasonal percent is 163%. The second highest proportion is observed in March and September (110%). This may be associated with seasonality of marriage in July, August, November and December.

3.3: Seasonal variation in deaths

Causes of deaths are the most important item of information useful for policy makers. Many of the deaths in first year of life, especially in the

developing countries are due to the infections spread by environmental factors (El Deeb, 1988) which may be associated with seasonality. So this section will deal with seasonal variations of infant deaths. The data of the official vital statistics which are presented in table (4) show that the highest percentage of deaths in the summer months, mainly August and July 145% and 140% due to the diarrhoeal diseases. Second in ranking is the month of January 112% due to respiratory diseases. The proportion reached its minimum percent in April (61%). There is increasing trend in the proportions of infant deaths in the summer months from (1987-1996) with some fluctuations in between that might be due to the diarrheal diseases.

Table (3)
Seasonal variation in Births in Rural Behera Governorate
1987-1996

Month	No. of Birth Standard year (Average 1987-1996)	Standard value after Excluding general trend	Seasonal percent
January	11847	11879	163
February	7284	7348	101
March	7948	8044	110
April	6465	6593	90
May	6055	6215	85
June	5966	6158	84
July	5805	6029	83
August	6629	6885	94
September	7732	8020	110
October	6763	7083	97
November	6678	7030	96
December	5987	6371	87
Average total	7097	7305	100

Coefficient of change in general trend = -31.8679

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Figure (3)
Seasonal variation in Births in rural Behera Governorate
1987-1996

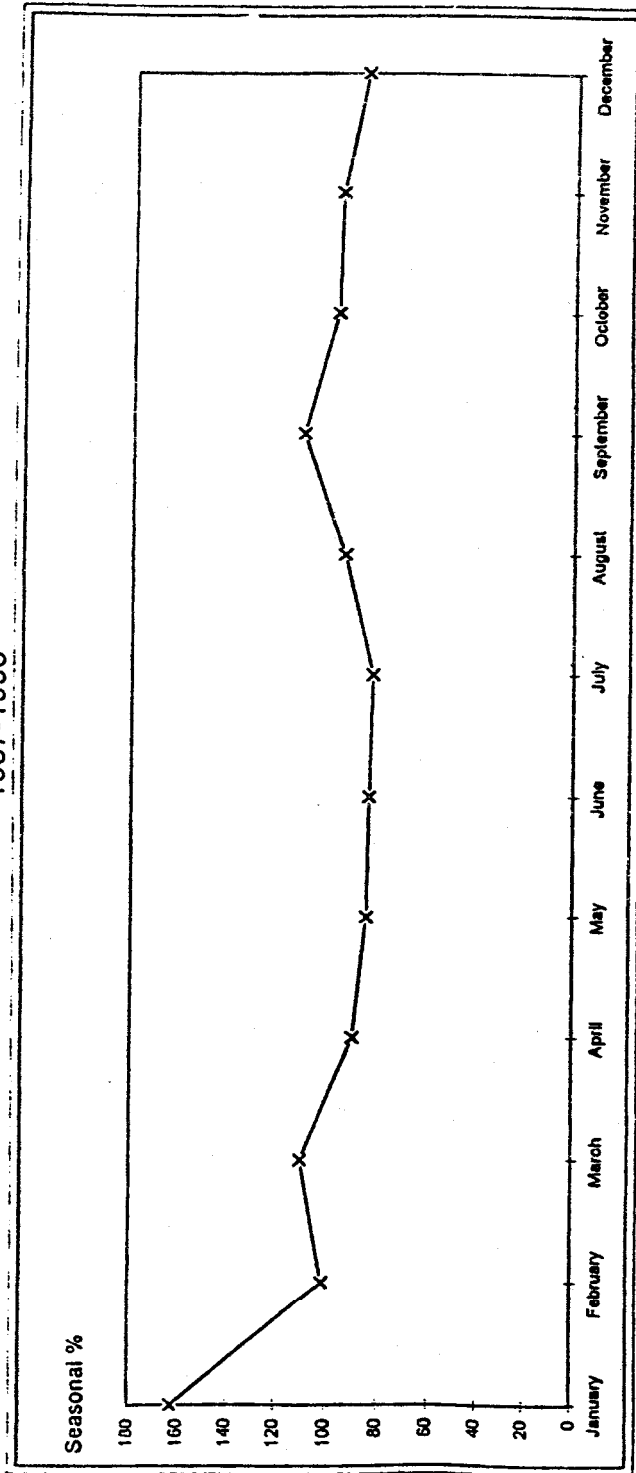
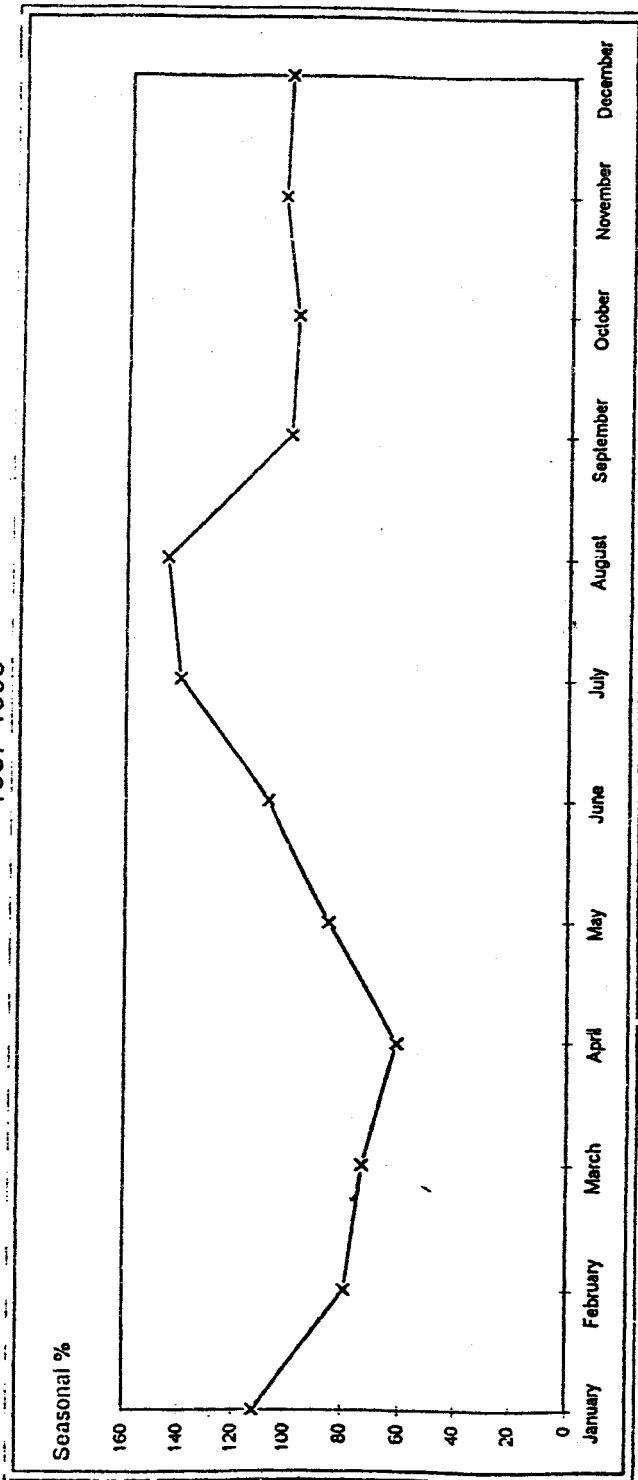


Table (4)
Seasonal variation in Deaths in Rural Behera Governorate
1987-1996

Month	No. of Infant Deaths Standard year (Average 1987-1996)	Standard value after Excluding general trend	Seasonal percent
January	237	239	112
February	165	169	79
March	151	156	73
April	124	131	61
May	174	183	85
June	219	230	107
July	287	299	140
August	297	311	145
September	195	211	99
October	189	207	97
November	198	217	102
December	192	213	100
Average total	202	214	100

Coefficient of change in general trend = -1.76595

Figure (4)
Seasonal variation in Deaths in rural Behera Governorate
1987-1996



SECTION FOUR

Summary and Policy Implication

4.1: Summary

This study was an attempt to examine seasonal variations in marriage, divorce, births and deaths. The study revealed that marriage is most prevalent in November and December. The seasonal percent is 128% in November and 126% in December. This may be associated with seasonality of agricultural crops, where rice is harvested in October, in Behera. On the other hand, the lowest seasonal proportion for marriage is observed in February (66%) then April (78%). It appears from the analysis of the available data of rural Behera governorate that the highest percentage of divorce occurs in the month of September whereas the index reaches (171%). Second in ranking is the month of March (148%) followed by December (144%). On the other hand, February and May score the lowest percentage with an index of (66%), followed by November (72%), which may be attributed to the influence of income in this governorate.

The seasonal births is most prevalent in January (163%). The second highest proportions is observed in March and September (110%). This may be associated with seasonality of marriage in July, August, November and December. Regarding deaths, the analysis shows that the highest percentage of deaths is observed in the summer months, mainly July and August (145% and 140%) due to the diarrheal diseases. Second in ranking is the month of January (112%) due to respiratory diseases. The proportion reached its minimum percent in April (61%).

4.2: Some Policy Implication

- Taking the necessary health services in order to reduce the season-related diseases such as diarrheal diseases and respiratory infections diseases.
- Increase husbands' and wives' perception towards family relationship through mass-media.
- Highlight the impacts of marriage disolutions on raising children.

Table (1 A)
Number of marriage contracts in Rural Behera Governrate by months

Month	87	88	89	90	91	92	93	94	95	96
January	2103	2058	811	1745	2155	1581	1944	2624	1535	1658
February	1883	1681	900	1514	1416	787	1301	960	367	1393
March	1913	2147	1900	1854	1071	491	1049	1911	2522	2110
April	1662	1477	615	758	1255	1702	1749	1512	1601	2120
May	844	1277	1614	1622	1468	1140	1061	1781	2417	2143
June	1922	1475	2803	1172	1491	1698	1555	1669	1271	1935
July	1788	2172	2733	2456	1927	2116	1783	2173	2629	2406
August	2988	2124	1873	2172	1762	1824	1857	2037	2811	2841
September	2484	2255	1628	1768	1192	1664	1406	2136	2484	2256
October	2180	1780	1549	1634	846	1695	1819	1712	2095	2069
November	1903	2214	1656	2562	2136	2866	2509	2640	2998	2392
December	2144	2256	1983	2431	1477	2404	2566	2115	2930	3254
Total	23814	22916	20065	21688	18196	19968	20599	23270	25660	26577

Table (2.A)
Number of certificate in divorce in Rural Behera Governorate

Month	87	88	89	90	91	92	93	94	95	96
January	270	213	223	242	214	170	183	178	221	172
February	258	198	171	239	192	133	173	129	83	115
March	255	237	141	223	178	81	88	168	197	227
April	256	194	127	109	123	151	198	216	184	199
May	117	146	152	218	130	157	126	152	186	185
June	280	178	63	183	104	141	172	168	146	216
July	289	203	175	267	70	204	195	213	228	219
August	246	257	231	250	189	169	217	224	234	245
September	293	246	222	174	171	123	172	207	205	197
October	156	222	230	213	173	166	182	175	159	159
November	241	186	186	191	144	200	154	162	148	164
December	532	239	230	170	115	193	185	198	200	161
Total	3193	2519	2151	2479	1803	1888	2045	2190	2191	2259

Table (3 A)

Number of births in Rural Behera Governorate

Month	87	88	89	90	91	92	93	94	95	96
January	16358	12607	11507	14856	11778	10008	10328	9669	11360	9994
February	8987	9128	8201	10112	5759	6216	7837	5760	5116	5721
March	10472	10221	7816	9720	7352	6339	6727	6436	6820	7575
April	8689	8159	5728	5131	6002	6315	7564	5705	6328	5027
May	6616	6444	5601	7848	7942	6320	4952	4735	4865	5221
June	8549	8142	5608	7668	4945	5004	3035	5765	5051	5891
July	7634	6197	6024	6314	6848	6015	3534	5336	4863	5273
August	7288	8810	7569	6888	5359	6321	7625	5589	4904	5931
September	9467	9256	7948	7901	5800	7572	8204	6740	6792	7631
October	8033	8434	7593	7008	7336	5732	5560	6184	5787	5957
November	8883	8845	7719	6562	6113	5590	6356	5521	5562	5616
December	9130	9531	6907	6460	4761	4809	4780	4928	4735	3813
Total	1E+05	1E+05	88221	96468	79995	76241	76502	72368	72183	73650

Table (4 A)
Number of deaths in Behera Governorate (Rural)

Month	87	88	89	90	91	92	93	94	95	96
January	250	479	272	226	162	189	338	139	139	185
February	214	164	180	260	184	146	145	134	134	115
March	235	166	167	200	141	93	107	150	150	129
April	252	134	117	169	138	84	85	90	90	79
May	314	225	250	224	173	97	118	136	136	89
June	430	277	271	288	205	153	201	113	113	113
July	484	411	347	369	245	211	262	182	182	147
August	554	305	320	396	299	243	186	180	180	171
September	313	210	220	275	201	201	135	139	139	117
October	291	239	212	324	189	128	146	114	114	101
November	266	360	203	196	216	150	175	142	142	129
December	295	264	230	175	263	151	124	145	145	87
Total	3898	3324	2789	3102	2416	1846	2022	1664	1664	1462