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| Seasonal Variation in Vital Statistics in Rural of Behera Governnorate | :العنوان |
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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.

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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

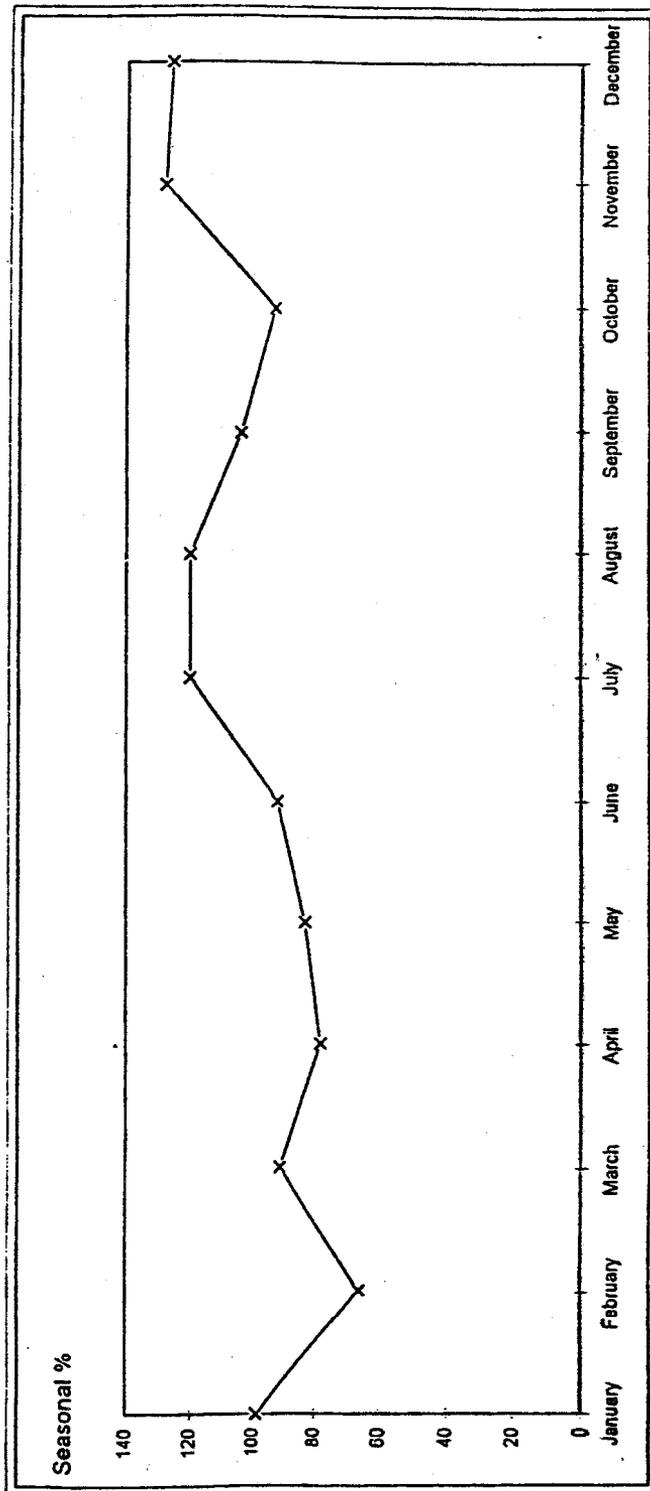
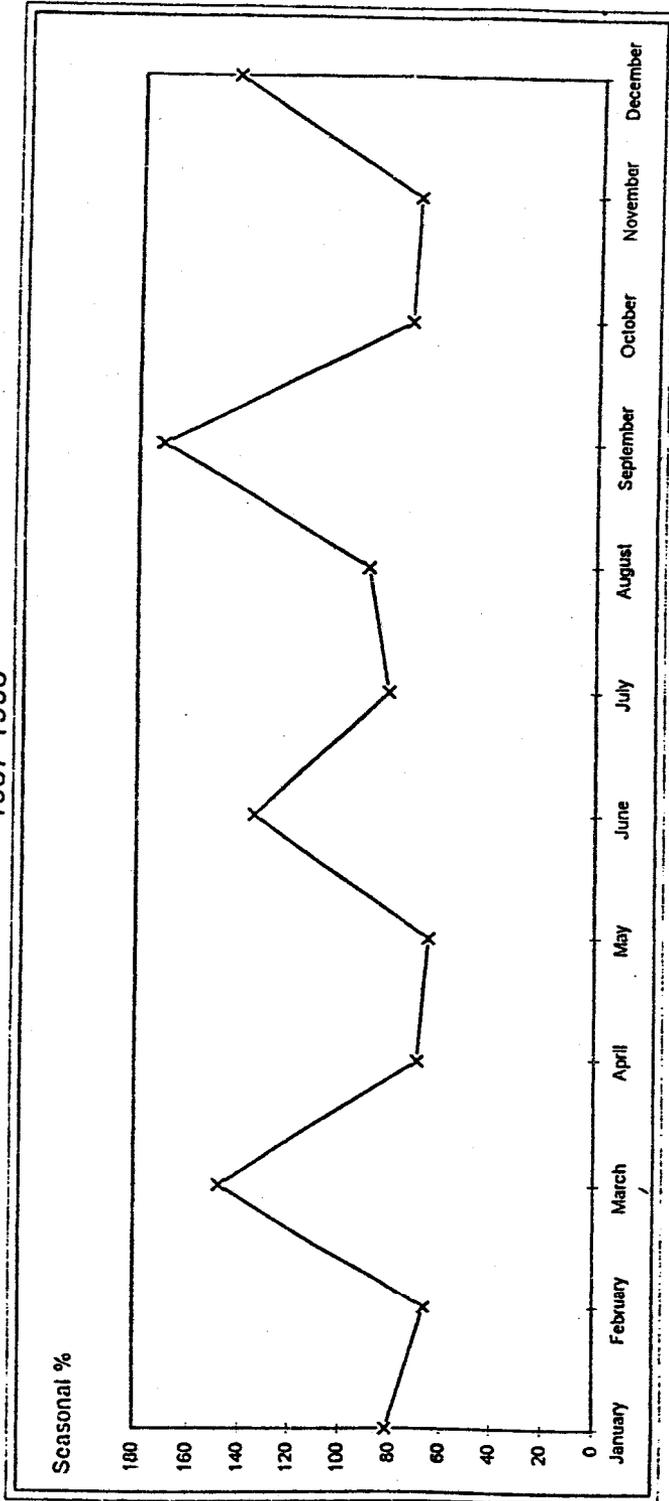


Table (2)
Seasonal variation in Divorce certificates in Rural Behera Governorate
1987-1996

| 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

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

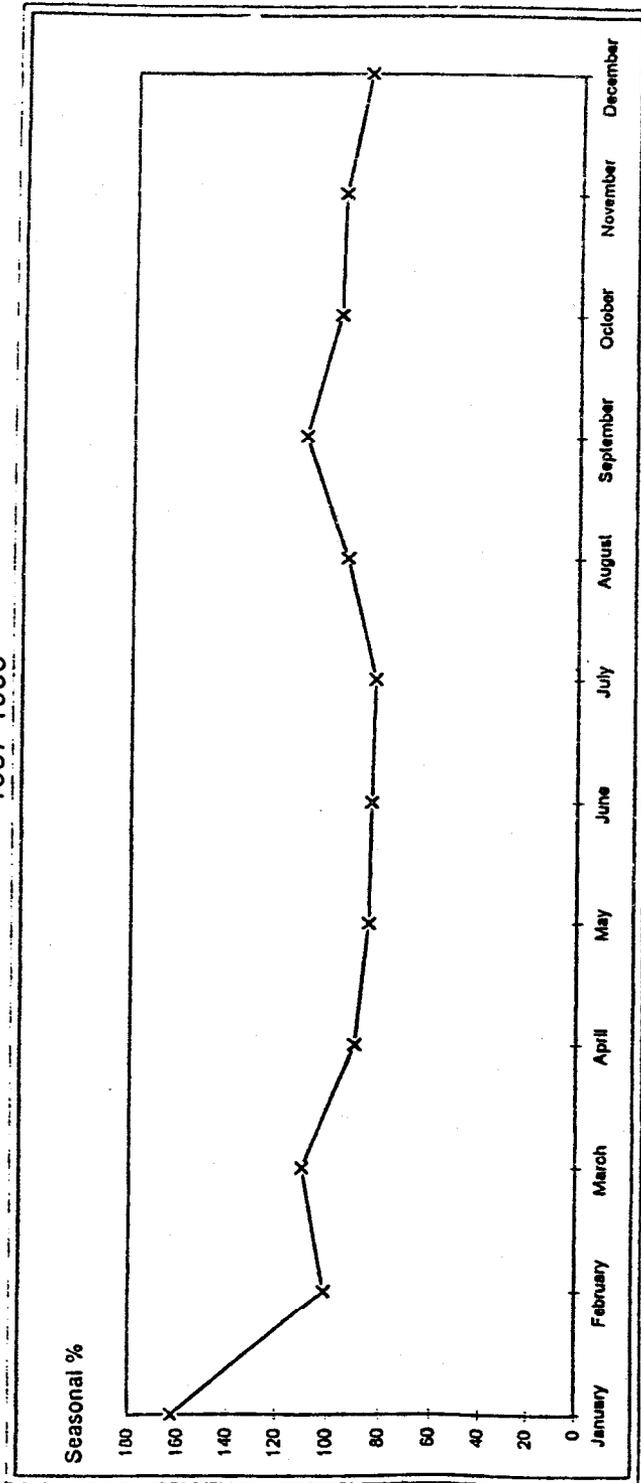
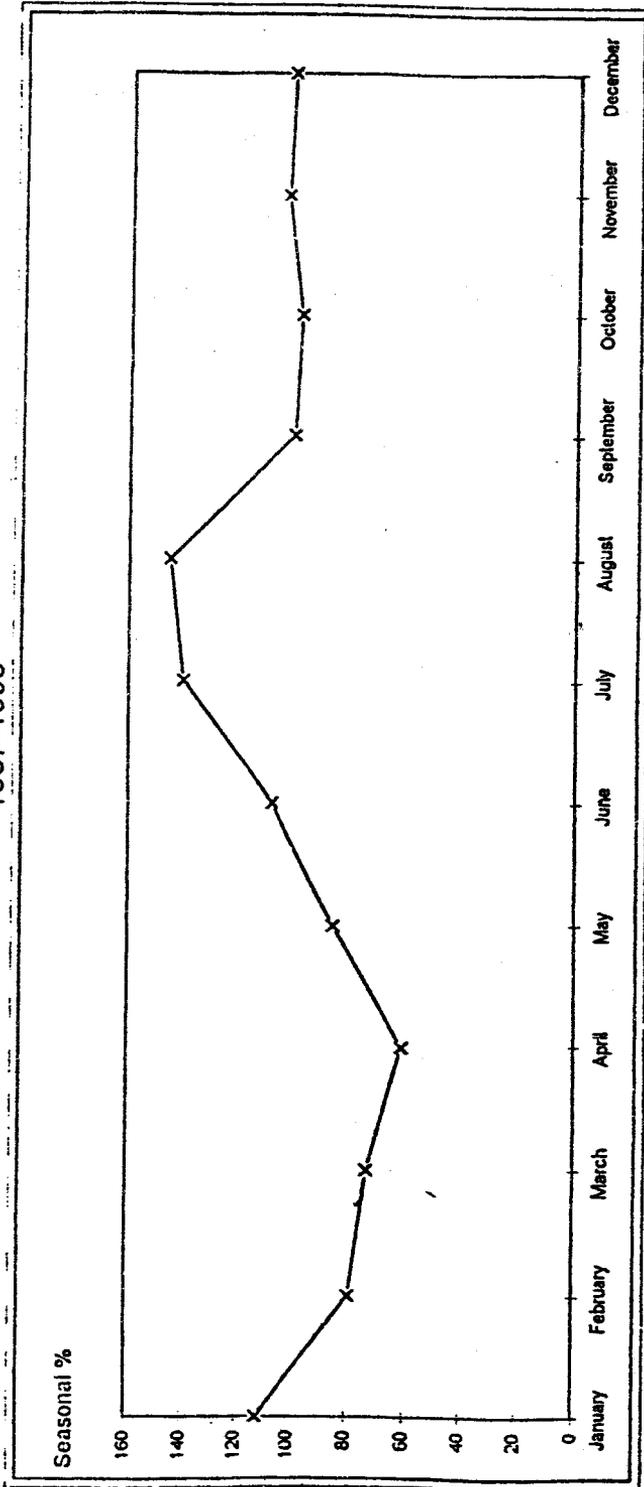


Table (4)
Seasonal variation in Deaths in Rural Behera Governorate
1987-1996

| 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 is 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 |