# THE RELATIONSHIP BETWEEN INFANT MORTALITY AND CRUDE BIRTH RATES IN ALEXANDRIA (1966 — 1971)

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## INTRODUCTION

In developing countries, children and childbearing women make up large proportions often three quarters-of the total population. Also, infant and child mortality constitute largest segment of total mortality and the associated high level of maternal morbidity of course contributes to this.

The reproductive wastage due to high infant mortality promotes patterns o rfeproduction which further compound the hazards to health and survival of mothers, newborns and infants. These patterns are characterised by high natality and include childbearing begining at too early ages, in too rapid succession and in too great numbers. Moreover, high fertility with its inherent demands on the mother during pregnancy and after birth, tends futher to decrease infant care and thus potentiates environmental risks. Thus a self-perpetuating cycle of high infant mortality and of childbearing patterns that impair maternal health is set up that leads to defective foetal development and high newborn and infant mortality. The toll on maternal and and infant and the economic and physiological drain of high mortality, are intensified by the negative effects of poor socioeconomic conditions that characterise these situations. It must be remembered also that high infant mortality is invariably associated with high life-long morbidity and short life expectancy. (W. H. O., Human Reproduction Unit. Maternal Health And Infant Mortality. A. Kessler, 1969).

The promotion of maternal and child health including Family Planning can contribute substantially to the reversal of these patterns and to economic advancement. Also reduction of infant mortality and increased expectation of child survival are basic factors in the development of responsible parenthood.

## PURPOSE OF STUDY

By the end of 1971, 6 years would have passed since the start of the Family Planning Programme in Alexandria. The objective of this paper is to study the correlation between the Crude Birth Rate (C.B.R) and Infant Mortality Rate (I. M. R.) in Alexandria during this same period.

## MATERIAL

1. Data concerning births, deaths and infant mortality were collected from the health offices and rural health units in Alexandria Governorate where registration of births and deaths is carried out. It is to be noted however, that registration of births and deaths is carried out according to place of occurance (i.e. De facto classification) and not place of residence.

2. To calculate C. B. R. and Crude Death Rates (C. D. R.) of 1966 the sample census figures were used. Accordingly the total poulation of Alexandria in 1966 was 1,801,056 without Amiria district and 1,817,711 with Amiria. The population of Alexandria from 1967 on was estimated yearly using the natural increase method.

3. The relationship between I. M. R. and C. B. R. in different districts of Alexandria and in the whole Governorate from 1966 to 1971 was computed using the product moment coefficient of correlation method.

4. An area analysis was followed as Alexandria Governorate is administratively divided into 4 zones viz : Eastern, Middle, Western and Amiria zone. Each zone is again subdivided into districts-the number of districts in the whole Governorate is 12-which are further divided into subdistricts. Some of these subdistricts show features of rural communities e.g. : subdistricts of Montazah, Moharrem Bey and Amiria districts. In such rural communities high C. B. R. and C. D. R. are expected.

## RESULTS

1. Concerning the correlation between I. M. R. and C. B. R. in the 12 different districts of Alexandria from 1966 to 1971 as shown in table, is positive for the majority of districts but was negative in the following :

— El-Montazah district which shows features of rural community and El-Dekhela district which shows features of bedwin community. In both districts it is expected to have

high C. B. R. and C. D. R. and posibly incomplete registration of dead infants.

— The other districts showing negative correlation were Bab-Sharki and El-Attarin which are districts where many of the general and maternal hospitals are located and it has already been stated that registration of births and deaths is carried out according to place of occurance not place of residence.

— It should be noted also that although registration of births has almost reached perfection yet there is still lack of uniformity in the degree of abiding by the definition of the infant death and variation in completeness of its registration between the different districts thus influencing to a considerable degree the comparability of data. Presumably these two factors are more marked in rural and bedwin areas. Another point is that there is no complete congrondy between the area served by one or more health office and the area forming the administrative district.

2. Concerning the correlation between I. M. R. and C. B. R. in the whole Governorate from 1966 to 1971.

First it is noted that there is a steady decline in the C. B. R. from 1966 to 1971. Also is a decline in the I. M. R. in this same period.

Secondly, it is also noted that the percentage of infant deaths to total number of deaths has steadily declined from 1966 to 1971 in addition to the noticeable decline in the C. D. R. in the same period. The correlation coefficient between C. B. R. and I. M. R. is medium positive ($r = 0.72$). However this positive correlation is not significant at the 5% level. This may be explained by the fact that the time elapsed since the start of the Family Planning Programme in Alexandria was not enough to create responsible parenthood which can be reflected on I. M. R. to lead to a significant correlation.

TABLE I

Crude Birth Rate, Infant Mortality Rate and Infant Mortality Ratio By District from 1966 to 1971 and the Correlation Coefficient Between C.B.R. & I.M.R.

| Year | 1966 | | | 1967 | | | 1968 | | | 1969 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| District | C.B.R. | I.M.R. | I.M.Ra % | C.B.R. | I.M.R. | I.M.Ra % | C.B.R. | I.M.R. | I.M.Ra % | C.B.R. | I.M.R. | I.M.Ra % |
| El-Montazah | 35.7 | 140.4 | 41.2 | 34.7 | 129.3 | 42.2 | 36.2 | 132.1 | 40.9 | 34.7 | 129.0 | 38.1 |
| El-Raml | 35.4 | 157.8 | 46.1 | 33.1 | 150.2 | 46.5 | 33.9 | 159.6 | 46.4 | 33.5 | 147.0 | 44.6 |
| Bab-Sharki | 36.2 | 93.8 | 28.7 | 33.4 | 87.5 | 29.1 | 36.9 | 91.7 | 33.1 | 34.4 | 89.9 | 33.0 |
| Moharrem Bey | 39.4 | 138.7 | 37.0 | 36.2 | 132.7 | 40.9 | 33.9 | 136.7 | 34.9 | 51.2 | 134.8 | 34.0 |
| El-Attarin | 26.0 | 165.0 | 14.9 | 27.2 | 111.3 | 11.6 | 29.0 | 127.0 | 12.8 | 26.5 | 136.7 | 12.3 |
| El-Manshia | 23.3 | 157.7 | 33.6 | 21.4 | 114.6 | 30.3 | 22.0 | 159 | 39.2 | 20.4 | 158.2 | 36.7 |
| El-Gomruk | 23.4 | 202.1 | 36.3 | 21.6 | 135.4 | 28.7 | 21.3 | 172.7 | 33.5 | 19.3 | 175.0 | 31.5 |
| El-Labban | 34.4 | 185.9 | 44.3 | 29.0 | 185.8 | 45.2 | 29.8 | 2.3.1 | 47.3 | 27.8 | 201.9 | 45.3 |
| Karmouz | 35.5 | 164.2 | 39.5 | 30.2 | 133.3 | 38.4 | 29.4 | 161.7 | 39.0 | 27.6 | 156.8 | 39.2 |
| Mina El-Bassal | 63.3 | 120.2 | 40.3 | 57.7 | 98.4 | 37.7 | 53.3 | 129.5 | 45.6 | 51.2 | 115.8 | 45.5 |
| El-Dekhela | 23.3 | 143.4 | 47.1 | 21.8 | 118.4 | 43.8 | 23.3 | 144.2 | 47.0 | 21.7 | 130.9 | 49.3 |
| El-Amiria | 59.3 | 82.1 | 31.5 | 63.2 | 62.8 | 32.1 | 71.9 | 87.5 | 33.9 | 58.8 | 84.9 | 29.4 |
| Governorate Total | 37.0 | 140.4 | 36.6 | 34.2 | 122.6 | 36.0 | 34.1 | 137.7 | 37.3 | 32.5 | 131.9 | 36.0 |

TABLE 1 ( Cont. )

| Year | 1970 | | | 1971 | | | Correlation Coefficient |
|---|---|---|---|---|---|---|---|
| District | C.B.R. | I.M.R. | I.M.R.a % | C.B.R. | I.M.R. | I.M.Ra % | |
| El-Montazah | 33.6 | 125.5 | 34.0 | 35.9 | 92.6 | 30.9 | —0.1593 |
| El-Raml | 33.3 | 136.7 | 40.1 | 33.2 | 135.7 | 33.9 | +0.6506 |
| Bab-Sharki | 34.7 | 90.1 | 30.9 | 37.6 | 80.6 | 29.8 | —0.4317 |
| Moharrem Bey | 27.7 | 117.9 | 30.4 | 28.3 | 108.7 | 31.4 | +0.8058 |
| El-Attarin | 21.7 | 144.0 | 11.1 | 25.3 | 118.0 | 9.3 | —0.3329 |
| El-Manshia | 18.4 | 157.0 | 32.6 | 17.8 | 81.5 | 22.2 | +0.5091 |
| El-Gomruk | 17.9 | 142.0 | 25.0 | 17.8 | 107.8 | 22.4 | +0.7051 |
| El-Labban | 25.5 | 191.8 | 41.2 | 26.3 | 165.1 | 45.2 | +0.5393 |
| Karmouz | 25.8 | 142.7 | 32.5 | 25.2 | 154.7 | 37.4 | +0.3291 |
| Mina El-Bassal | 45.1 | 123.7 | 40.4 | 42.7 | 98.5 | 39.4 | +0.1518 |
| El-Dekhela | 23.9 | 124.6 | 43.4 | 24.9 | 102.2 | 44.1 | —0.2904 |
| El-Amiria | 59.8 | 77.6 | 24.8 | 61.9 | 75.1 | 28.8 | +0.1968 |
| Governorate Total | 30.7 | 124.2 | 32.2 | 31.2 | 110.1 | 31.4 | +0.7162 |

.B. C.B.R. = Crude Birth Rate per thousand
I.M.R. = Infant Mortality Rate per thousands
I.M.Ra = Infant Mortality Ratio per cent. $= \frac{\text{No. of dead infant}}{\text{total No. of deaths}} \times 100$