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**The Impact of Socioeconomic Setting and Program Effort on  
Contraceptive Prevalence in the Egyptian Governorates,**

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by

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**1. INTRODUCTION**

Two broad explanations for the remarkable observed fertility differentials and trends are offered in the demographic literature. The first, sees socioeconomic development as the primary factor responsible for changes in reproductive behaviour. As the society develops, the cost of children rises and their benefits decline, thus leading to a lower desired family size and an increase in the demand for contraception. An alternative explanation points to the importance of the supply side, through the introduction of organised family planning programs. Such programs are expected to increase contraceptive use which in turn reduces fertility regardless to the level of development.

But, a growing consensus now exists that socioeconomic development and family planning programs have both played significant roles in bringing about fertility decline (Bongaarts, 1993). Also, it is believed that socioeconomic development affects the performance of the family planning programs (Lapham & Mauldin, 1985) and that family planning effort can influence socioeconomic development. A balance of both, family planning effort and socioeconomic development, is needed and should be responsive to the specific needs and conditions of specific countries and agree with their level of demographic transition (World Bank, 1994).

During the past two decades, Egypt achieved a remarkable success in promoting contraceptive use which increased steadily since 1980. The Contraceptive Prevalence Rate (CPR) almost doubled over a 12-year period. It increased from 24 percent in 1980 to 47 percent in 1992. However, the differences between geographical regions in the level of contraceptive use are very large. In 1980 the CPR in the Urban governorates (44.0%) was eleven times that in rural Upper Egypt (4.0%). This ratio became about 2 to 1 by 1992 (59.1% vs. 31.4%). In general, regional differences in contraceptive use have narrowed down as regions with initially lower levels in 1980 were able to achieve much faster increases than the regions with initially higher levels. However, CPR still varies between the Egyptian governorates. While it was 62.1 percent in Alexandria in 1992, it was only 19.8 percent in Souhag in the same year (El Zanaty et. al., 1993).

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## 2. OBJECTIVES

At this overall level of CPR, further reduction in fertility through increasing CPR become more difficult than before (Rutenberg et. al., 1991). Seeking to reduce the regional and governorate differentials in CPR may be the most effective alternative to bring fertility down in the governorates with low levels of prevalence by creating demand for contraception and offering high quality family planning services. To achieve this balance, studies to identify the factors that cause the variation in CPR among governorates are highly demanded. This study aims to measure the impact of the socioeconomic setting and the family planning program effort on the variations in CPR at the level of the governorates in 1992. More specifically, the study is carried out to accomplish the following objectives:

1. To develop an index to measure the socioeconomic setting (SES) and an index to measure the family planning program effort (PE) at the level of the governorates.
2. To measure the extent to which the socioeconomic setting and the program effort affect contraceptive prevalence rates at the level of the governorates, and to measure the impact of the socioeconomic setting on the program effort.

## 3. THE SOCIOECONOMIC INDEX

There are different strategies for the construction of composite indices. In this study, we use standardised scores with equal weights. Accordingly, the standardised score for each indicator is computed as follows :

$$Z_i = (X_i - \bar{X}_i) / S_i \quad \text{where}$$

$Z_i$  = standardised score for indicator i ;

$X_i$  = observed value of indicator i;

$\bar{X}_i$  = mean value of the indicator values; and

$S_i$  = standard deviation of the indicator values

The overall value of the SES index by governorate is calculated as follows:

$$SES_x = \sum Z_i / (k) \quad \text{where:}$$

$SES_x$  = Socioeconomic setting index for X governorat  and,

k = The number of indicators

### 3.1 Development Indicators

The availability of comparable and reliable data is the main constrain for the construction of the development index. Many combinations of the available variables were sorted to select a combination of variables which give the highest correlation with contraceptive prevalence rate. Seven indicators have been selected to construct a governorate based index for the socioeconomic setting. Table (1) presents the values while their statistical description is given in the appendix. These variables are :

### 1. Literacy Rate for Population 10 Years and More

The higher the literacy rate the higher the development in any country. From table (1) it is noticed that the highest literacy rate is found in Port Said (68.2%), while the lowest one is found in Fayoum (33.9%). It is noticed also that the literacy rates are lower in Upper Egypt than Lower Egypt , which is also lower than in the Urban governorates.

### 2. Primary and Secondary School Enrolment

The enrolment ratio for primary and secondary schools was selected as the process of enlarging the stock of population literacy. Table (1) shows that the highest enrolment ratio is found in the Urban governorates (over 60%) and Ismailia and the lowest in Beni Suef (36.8%).

### 3. Life Expectancy at Birth

The life expectancy at birth reflects the nutrition status and quality of health services available in the society (UNDP, 1990). Table (1) shows that the highest life expectancy at birth is found in Port Said (67.5 years) , followed by Alexandria and Damitta (65.8 , 65.3 years ). The lowest is found in Souhag (60.3 years) and Beni Suef (60.7 years).

### 4. Infant Mortality Rate

The infant mortality rate deserves special consideration because it is in this rate that the greatest improvement in mortality has taken place, mainly through public health measures and medical discoveries (Pollard et. al. ,1981). It is seen from table (1) that the lowest infant mortality rate is found in Damietta (21/1000), while the highest is found in Aswan (64 /1000) . In general the highest infant mortality rates are found in Upper Egypt.

### 5. Per Capita Income

This indicator is used as a measure of the economic welfare. As reported in table (1) the highest per capita income is found in Port Said (1718 LE) and the lowest is found in Menya (730 LE).

### 6. Percent Working in Agriculture

The percent of the population working in agriculture is considered as an indicator of the prevalence of traditional attitudes and behaviour in the society. It reflects also the structure of the economy. The higher the percent working in agriculture, the lower the economic performance. Table (1) shows that the lowest percentages are found in the urban governorates, while the highest are found in Menya, Assuit, and Souhag : 61.4%, 59.4% and 58.6% respectively.

### 7. Percent Urban

The simplest measure of urbanisation is the percent of the total population living in urban areas. People who are living in urban areas are more able to accept new

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ideas and they are more exposed to the western life style. Four Egyptian governorates are totally urban : Cairo, Alexandria, Port Said and Suez. The percent urban in the other governorates range between 57.5% in Giza and 20.1% in Menoufia.

### 3.2 SES Index Values By Governorate

The value of the SES index by governorate are given in table (2) . The governorates are clustered accordingly in three groups . The difference between the lowest value of each group and the highest value of the presiding group is higher than the intra-group differences. The highest development category values ranged between 0.91 and 0.27, it includes five governorates : Port Said, Cairo, Suez, Alexandria and Dakahlia. The medium development category lies between 0.19 and -0.05 and includes seven governorates : Damietta, Ismailia, Aswan, Gharbia, Menoufia, Kalyoubia and Giza. The third category values ranged between -0.23 and -0.58 and include the nine least developed governorates: Sharkia, Kafrel Sheikh, Assuit, Behera, Fayoum, Qena, Menya, Beni Suef and Souhag. It is important to test the validity and reliability of the SES index.

**TABLE ( 1 ) : SOCIOECONOMIC INDICATORS FOR THE EGYPTIAN GOVERNORATES .**

| Governorate   | Literacy<br>Rate<br>Pop.<br>10+<br>(1) | Gross<br>Enrolment<br>Ratio<br>1990<br>(2) | Life<br>Expectancy<br>1989<br>(3) | Infant<br>Mortality<br>Rate<br>1989<br>(4) | Per<br>Capita<br>Income<br>LE<br>(5) | Percent<br>working<br>in<br>Agricuilt.<br>(6) | Percent<br>Urban<br>(7) |
|---------------|--|--|-----------------------------------|--|--------------------------------------|---|-------------------------|
| Cairo         | 69.0                                   | 90.00                                      | 64.4                              | 37   | 1223.6                               | 4.2   | 100.0                   |
| Alexandria    | 66.2                                   | 88.20                                      | 65.8                              | 26   | 1089.9                               | 9.8   | 100.0                   |
| Port Said     | 68.2                                   | 84.80                                      | 67.8                              | 26   | 1718.1                               | 12.7  | 100.0                   |
| Suez          | 65.5                                   | 93.80                                      | 63.6                              | 38   | 1032.3                               | 11.1  | 100.0                   |
| Damietta      | 58.5                                   | 86.70                                      | 68.3                              | 21   | 1382.6                               | 33.1  | 28.2                    |
| Dakahlia      | 50.9                                   | 80.70                                      | 64.6                              | 26   | 1487.1                               | 41.6  | 26.2                    |
| Sharkia       | 46.9                                   | 71.60                                      | 63.3                              | 38   | 908.8                                | 50.2  | 21.1                    |
| Kalyoubia     | 54.2                                   | 70.90                                      | 63.7                              | 44   | 773.2                                | 25.3  | 43.8                    |
| Kafrel-Sheikh | 39.7                                   | 68.80                                      | 63.7                              | 34   | 1181.8                               | 57.3  | 32.8                    |
| Gharbia       | 52.4                                   | 79.30                                      | 65.9                              | 38   | 923.6                                | 37.2  | 32.7                    |
| Menoufia      | 51.9                                   | 82.90                                      | 64.9                              | 41   | 786.7                                | 44.7  | 20.1                    |
| Behera        | 42.5                                   | 73.80                                      | 62.2                              | 33   | 768.3                                | 53.9  | 23.4                    |
| Ismailia      | 58.2                                   | 87.60                                      | 63.8                              | 30   | 1038.9                               | 30.0  | 48.8                    |
| Giza          | 54.9                                   | 73.00                                      | 62.7                              | 43   | 1060.9                               | 19.7  | 57.8                    |
| Beni Suef     | 36.8                                   | 88.60                                      | 60.7                              | 54   | 736.0                                | 57.3  | 28.1                    |
| Fayoum        | 33.9                                   | 68.80                                      | 62.8                              | 48   | 773.3                                | 59.4  | 23.2                    |
| Menya         | 38.3                                   | 68.70                                      | 61.0                              | 52   | 730.2                                | 61.4  | 20.8                    |
| Assuit        | 30.2                                   | 67.10                                      | 61.7                              | 58   | 742.2                                | 58.6  | 27.9                    |
| Souhag        | 35.3                                   | 64.80                                      | 60.3                              | 47   | 764.9                                | 58.8  | 22.0                    |
| Qena          | 36.6                                   | 70.20                                      | 62.0                              | 48   | 810.3                                | 47.3  | 23.4                    |
| Aswan         | 53.1                                   | 82.90                                      | 61.4                              | 64   | 766.1                                | 34.1  | 39.6                    |

Sources of Table ( 1 ) :

- (1) Calculated from: CAPMAS, (1989) "1986 Population Census".
- (2) Calculated depending on data obtained from: Ministry of Education, (1992). "Education Statistical Year Book, 90/91" and CAPMAS, "Statistical Year Book".
- (3) Institute of National Planning; (1994) "Egypt: Human Development report, 1994".
- (4) CAPMAS, Vital Statistics.
- (5) Calculated from: CAPMAS, (1991) "Income and Expenditure Survey, 1990/91" Vol. IX, Part I, Table (1), and Vol. IX, Part I, Table (1).
- (6) CAPMAS, (1989) "1986 Population Census", Table (10).
- (7) Calculated from: CAPMAS, (1989) "1986 Population Census".

Governorates.

| Governorate      | Index Value | Rank |
|------------------|-------------|------|
| <b>High:</b>     |             |      |
| Port Said        | 0.91        | 1    |
| Cairo            | 0.61        | 2    |
| Suez             | 0.51        | 3    |
| Alexandria       | 0.48        | 4    |
| Dakahlia         | 0.27        | 5    |
| <b>Moderate:</b> |             |      |
| Damietta         | 0.19        | 6    |
| Ismailia         | 0.16        | 7    |
| Aswan            | 0.12        | 8    |
| Gharbia          | 0.08        | 9    |
| Menoufia         | 0.08        | 10   |
| Kalyubia         | 0.04        | 11   |
| Giza             | -0.05       | 12   |
| <b>Low:</b>      |             |      |
| Sharkia          | -0.23       | 13   |
| Kafrei-Sheikh    | -0.27       | 14   |
| Assuit           | -0.26       | 15   |
| Behera           | -0.31       | 16   |
| Fayoum           | -0.37       | 17   |
| Qena             | -0.37       | 18   |
| Menya            | -0.42       | 19   |
| Beni Suef        | -0.51       | 20   |
| Souhag           | -0.58       | 21   |

**A. Testing The Validity of The SES Index**

Validity is defined as the extent to which any measuring instrument measures what it is intended to measure i.e. validity is concerned with the relationship between the concept ( socioeconomic setting) and the indicator ( socioeconomic setting index).

This may be tested by empirical or conceptual confirmation which has generalised applicability in the social sciences (Carmines and Zeller, 1979). Empirically, the indicators that were used in the construction of the SES index are consistent with what is found in the demographic literature. Cutright (1983), in his study about the ingredients of recent fertility decline in developing countries, found that the most important socioeconomic factors that affect fertility reduction are: GNP per capita , percent urban, percent literate and life expectancy. In addition , Lapham and Mauldin (1985) found that infant mortality, school enrolment , and percent working in agriculture have a significant effect on contraceptive prevalence rates in developing countries.

The conceptual validity of the SES index is tested by considering its relationship with the Human Development Index developed by the United Nations Development Program (UNDP, 1990) and which was calculated by the Institute of National Planning for the Egyptian governorates . Figure (1) shows the strong relationship between the two indicators. The correlation coefficient between them is 0.93. Both tests confirm the validity of the SES index.

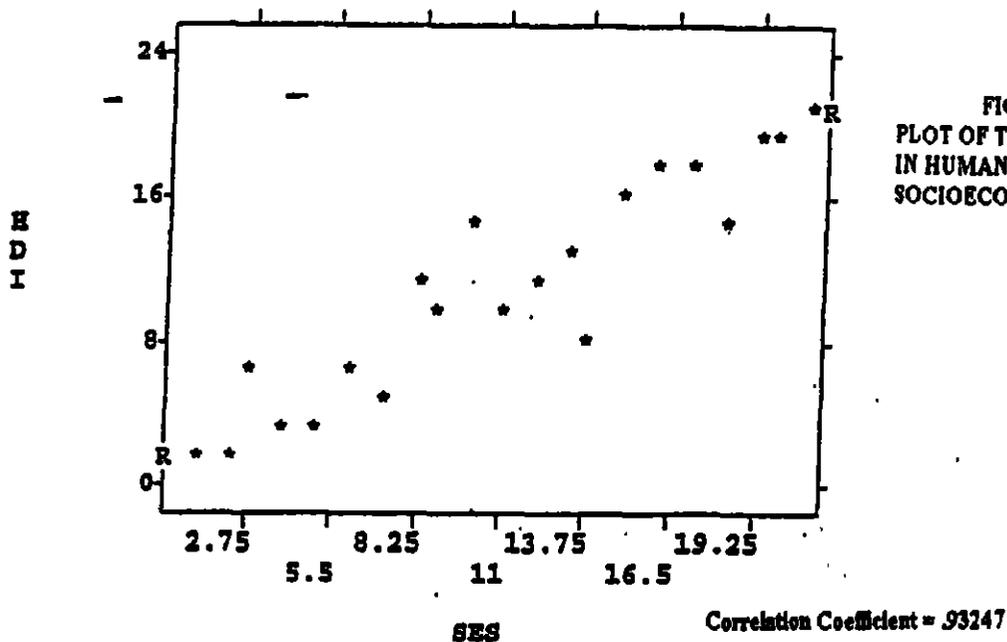


FIGURE (1.4)  
PLOT OF THE RANK OF GOVERNORATE  
IN HUMAN DEVELOPMENT INDEX VS  
SOCIOECONOMIC SETTING INDEX

**B. RELIABILITY OF THE SES INDEX**

Reliability is concerned with the extent to which any measuring procedure yields the same results on repeated trials. The 'internal consistency method' will be used to test the reliability of the SES ( Carmines and Zeller, 1979). The calculation of the reliability coefficient depends on the correlation matrix between the variables that are introduced in the construction of the index and can be expressed as follows:

$$r = \frac{\sum r_{ij}}{N-1} \sqrt{\frac{N}{N-1}}$$

where

$r$  = reliability coefficient  
 $N$  = number of items (indicators) and  
 $\bar{r}$  = mean inter item correlation

The value of  $\alpha$  ranges between zero and unity. the closer to unity the more is the reliability of the indicator. The mean inter item correlation is equal to the absolute values of the inter item correlation coefficients divided by their number. In the present case, the mean inter item correlation is equal to 13.54 divided by 21 equal to 0.645. The calculated  $\alpha$  for the SES index ingredients is equal to 0.82. As a general rule, reliabilities should not be below 0.80 for widely used scales. At that level, correlations are attenuated very little by random measurement error (Cramines and Zeller, 1979).

#### 4. FAMILY PLANNING PROGRAM EFFORT

Family planning programs are defined as organised programs designed to provide the information, supplies, and services of modern means of fertility control to those interested. Family planning program effort (PE) is the degree of commitment to these goals, in the private and public sectors.

The list of items developed by Lapham and Mauldin (1985) to be included in the calculation of the PE index and the method of grouping developed by Entwisle (1989) will only be used as a guide line because of the availability data. Also, some of these indicators will not be calculated at the level of the Egyptian governorates due to (a) the equality of their values in all of the governorates or (b) the non applicability to the Egyptian society (Zohry, 1995).

However, the method of calculating the values of each item used by Lapham and Mauldin will be employed, that is the lowest value for each indicator will be given a value of zero, and the highest one will be given a value of 4. The value of zero does not mean that there is no effort in this governorate, it means that this is the minimum observed value. Also 4 does not mean the maximum possible of an indicator, but it means the maximum observed.

##### 4.1 Program Effort Indicators

Nine indicators grouped under five broad items were selected to represent the program effort by governorate. A description of each indicator is given below and the values are presented in table (3).

##### I. Policy and Stage Setting Activities

##### 1. Number of the governorate Population Council Meetings

In each governorate, a Population Council is established which is responsible for the preparation and implementation of the governorate population plan and to follow up the achievement in this concern. Four meetings are to be held per year. The number of meetings per year is taken as a reflection of the strength of the

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**TABLE (3): VALUES OF THE PROGRAM EFFORT INDICATORS BY GOVERNORATE, EGYPT, 1992**

| Gov.          | Number of GPC Meetings | Women per FP Center | Women per Pharmacy | % Women Have FP in Place of Res. Women | IBAC Hours per (1000) | No. of Home Visits (1000) | % Stat. Rep. | Social Marketing % | % Non-Gov. Units |
|---------------|------------------------|---------------------|--------------------|--|-----------------------|---------------------------|--------------|--------------------|------------------|
|               | (1)                    | (2)                 | (3)                | (4)                                    | (5)                   | (6)                       | (7)          | (8)                | (9)              |
| Cairo         | 8                      | 4482                | 443                | 1.00                                   | 0.39                  | 6                         | 78           | 48.80              | 33.62            |
| Alexandria    | 2                      | 3834                | 399                | 1.00                                   | 1.29                  | 149                       | 96           | 34.29              | 29.27            |
| Port Said     | 4                      | 2620                | 646                | 1.00                                   | 2.03                  | 4                         | 80           | 87.68              | 28.87            |
| Suez          | 4                      | 1798                | 689                | 1.00                                   | 1.76                  | 312                       | 98           | 34.93              | 48.78            |
| Damietta      | 2                      | 1644                | 668                | 0.94                                   | 1.84                  | 862                       | 98           | 29.01              | 19.78            |
| Dakahlia      | 2                      | 1882                | 808                | 0.86                                   | 1.34                  | 867                       | 94           | 36.70              | 13.20            |
| Sharkia       | 4                      | 1672                | 680                | 0.77                                   | 1.14                  | 634                       | 93           | 32.34              | 13.84            |
| Kalyubia      | 2                      | 2701                | 780                | 0.73                                   | 0.44                  | 211                       | 96           | 29.81              | 18.26            |
| Kafrel-Sheikh | 3                      | 1533                | 812                | 0.80                                   | 1.31                  | 653                       | 99           | 33.17              | 13.68            |
| Gharbia       | 3                      | 2150                | 982                | 0.82                                   | 1.27                  | 584                       | 98           | 21.42              | 11.28            |
| Menoufia      | 4                      | 1584                | 666                | 0.82                                   | 1.20                  | 843                       | 97           | 24.83              | 12.50            |
| Behera        | 4                      | 1669                | 787                | 0.80                                   | 0.82                  | 681                       | 97           | 22.87              | 9.88             |
| Yamailia      | 2                      | 1683                | 1969               | 0.99                                   | 0.76                  | 22                        | 88           | 38.76              | 36.23            |
| Giza          | 1                      | 3893                | 668                | 0.96                                   | 0.24                  | 195                       | 96           | 42.98              | 18.39            |
| Beni Suef     | 2                      | 1985                | 1118               | 0.80                                   | 1.01                  | 481                       | 94           | 18.39              | 13.17            |
| Fayoum        | 1                      | 1620                | 1138               | 0.90                                   | 0.82                  | 461                       | 97           | 19.32              | 18.07            |
| Menya         | 2                      | 1669                | 900                | 0.84                                   | 0.83                  | 378                       | 96           | 15.71              | 18.54            |
| Assuit        | 2                      | 1719                | 883                | 0.87                                   | 0.39                  | 468                       | 98           | 23.76              | 33.04            |
| Souhag        | 4                      | 1769                | 644                | 0.83                                   | 0.82                  | 407                       | 93           | 22.18              | 16.89            |
| Qena          | 3                      | 1779                | 1122               | 0.90                                   | 0.74                  | 252                       | 84           | 11.63              | 9.61             |
| Aswan         | 0                      | 1023                | 1364               | 0.90                                   | 1.57                  | 684                       | 74           | 23.98              | 20.71            |

**Sources:**

- (1) NPC, General Administration of Follow Up and Evaluation (No date): "Report on Governorate Population Council Meetings in 1992", Unpublished report.
- (2) NPC, General Administration of Statistics (1993): "Annual statistical Report", NPC, Cairo, Egypt.
- (3) Calculated from: NPC, General Administration of Statistics (1993): "Annual statistical Report", and CAPMAS (1993): "Statistical Year Book".
- (4) Calculated from: NPC, General Administration of Statistics (1993): "Target Population for family planning activities by Governorate" and NPC, General Administration of Follow Up and Evaluation (No date): "Report on Villages and Places without Family Planning Services" Unpublished Report.
- (5) Calculated from: Center for Information, Education and Communication (No Date): "Report on IBAC Activities by Governorate, 1992", Unpublished Report and NPC, General Administration of Statistics (1993): "Annual statistical Report".
- (6) NPC, General Administration of Follow Up and Evaluation (No date): "Report on Ra'ida Rifia Activities in 1992 by Governorate", Unpublished report.
- (7, 8, & 9) Calculated from: NPC, General Administration of Statistics (1993): "Annual statistical Report", and CAPMAS (1993): "Statistical Year Book".

1992 population policy in the governorate. Only six governorates reached the maximum possible of meetings : Port Said, Suez, Sharkia, Menoufia , Behera, and Souhag while only two governorates did not carry out any meetings during 1992 : Cairo, and Aswan.

## II. Availability and Accessibility of Family Planning Services

### 2. Number of Women per Family Planning Centre

The highest number of women per clinic is found in Cairo (4462) followed by Alexandria and Giza (3834) and (3595) respectively. The lowest number of women per clinic is found in Aswan (1023). It is noticed that the governorates of Upper Egypt have a lower number of women per FP clinic than that in Lower Egypt , which in turn is lower than the urban governorates.

### 3. Number of Women per Pharmacy

The results of the Egypt Demographic and Health Survey (1992) showed that the percent of current users of contraceptives relying on pharmacies is 28.3% ( El Zanaty et. al., 1993). The highest number of women per pharmacy is found in Ismailia (1569) and the lowest is found in Alexandria and Cairo (399, 443). The availability of pharmacies is higher in the urban governorates than in Lower Egypt , which in turn is higher than in Upper Egypt.

### 4. Percent of Women who Have Family Planning Services in Their Localities

Many studies showed that the travel time for women to reach the family planning clinic is one of the important determinants of contraceptive use ( Hermalin , 1983). The statistic is calculated by dividing the number of currently married women in the reproductive age (MWRA) who have family planning services in their village by the total number of MWRA in the governorate. The urban governorates are fully covered by FP services (almost 100%). However, low levels of coverage are found in Kalyoubia and Sharkia (73% , 77% ) . The variation in coverage between Upper Egypt and Lower Egypt is not significant.

## III. Information, Education, and Communication Activities and Home Visits

The Information, Education and Communication Centre has more than 50 satellite centres in the governorates to carry out the FP message. In addition, the National Population Council, the Ministry of Social Affairs, and the Ministry of Health employ volunteer and non volunteer Home visiting workers.

### 5. Number of IE&C Hours per 1000 Women / year

The total number of hours used for IE&C activities is divided by the number of MWRA by governorate. The results show that the highest number of hours of IE&C activities per 1000 women is found in Port Said (2.03) and the lowest is found in Giza, Cairo and Assuit ( 0.24, 0.29, 0.39).

## 6. Number of Home Visits per Woman

Home visits are carried out by two types of worker, the *Raida Rifia* and the Health Visitor. They are responsible for recruiting new FP acceptors in addition to providing the advice for the current FP users. The highest number of home visits per thousand women is found in Menoufia followed by Behera ( 843 , 681). The lowest number of home visits is found in Cairo and Port Said (6,4).

## IV. Record Keeping and Statistics

### 7. Record Keeping and Statistical Reporting

The percent of family planning centres that send FP forms to the NPC in each governorate is taken as representative of the level of record keeping system and statistical reporting (Zohry, 1995). As can be seen from table (3), most of the governorates have a high percent of statistical reporting (above 90%). Few governorates have statistical reporting less than 90%. These are Aswan, Cairo, Port Said, Qena and Ismailia (74%, 75%, 80%, and 88%).

## V. Social Marketing and Private Sector

### 8. Social Marketing

The Family Of the Future (FOF) was responsible for the social marketing of contraceptive commodities until the end of 1992. Since the reference year of this study is 1992, the percentage contribution of the FOF in the distribution of contraceptives is used as a measure for the social marketing activities in the governorates. The contribution is measured in terms of Couple Years of Protection (CYP). The highest level of social marketing is found in Port Said , where 57.6% of the CYP was covered through social marketing, and the lowest level is found in Beni Suef and Menya (18.4% , 15.7%).

### 9. Private Sector

Encouragement of the private sector is one of the important features of the Egyptian FP policies. The percent of private FP centres is used as a measure of the contribution of the private sector in the FP program as reported in table (3) . High private participation (more than one third) is found in Suez, Ismailia , Cairo and Assuit ( 48.8%, 36.2%, 33.6%, 33.0%). On the other hand, low private participation is found in Souhag, Qena and Behera ( 10.9%, 9.6% , 9.6%).

## 4.2 PE Index Values By Governorate

The individual scores for each indicator are presented in table (4) and the value of the Program Effort Index (PE) by governorates are given in table (5) . The governorates are grouped in three categories according to the level of PE. The highest category values ranged between 24 and 19 and includes five governorates : Suez, Port Said, Alexandria, Damietta and Ismailia. The group with moderate PE includes eight governorates with PE index that lies between 18 and 15 : Menoufia, Kafrel Sheikh, Sharkia, Giza, Behera, Gharbia, Assuit and Dakahlia. The group

TABLE (4): THE PROGRAM EFFORT INDICATORS BY GOVERNORATE, EGYPT, 1992.

| Gov.          | Number of GPC Meetings (1) | Woman per FP Center (2) | Woman per Pharmacy (3) | % Women Have FP SERV. in Plac. of Res. (4) | TEEC Hours per Woman (1000) (5) | No. of Home Visits (1000) Woman (6) | % Stat. Rep. (7) | Social Mark-eting % (8) | % Non-Gover. Units (9) |
|---------------|----------------------------|-------------------------|------------------------|--|---------------------------------|-------------------------------------|------------------|-------------------------|------------------------|
| Cairo         | 0.00                       | 4.00                    | 0.15                   | 4.00                                       | 0.11                            | 0.01                                | 0.16             | 3.13                    | 2.45                   |
| Alexandria    | 2.00                       | 3.27                    | 0.00                   | 4.00                                       | 2.35                            | 1.64                                | 3.52             | 1.77                    | 2.02                   |
| Port Said     | 4.00                       | 1.86                    | 0.84                   | 4.00                                       | 4.00                            | 0.00                                | 0.96             | 4.00                    | 1.94                   |
| Suez          | 4.00                       | 0.90                    | 0.30                   | 4.00                                       | 3.40                            | 1.47                                | 3.84             | 1.83                    | 4.00                   |
| Damietta      | 2.00                       | 0.72                    | 0.91                   | 3.11                                       | 3.58                            | 2.66                                | 3.84             | 1.27                    | 1.04                   |
| Dakahlia      | 2.00                       | 0.65                    | 0.36                   | 1.93                                       | 2.46                            | 2.68                                | 3.20             | 2.00                    | 0.37                   |
| Sharkia       | 4.00                       | 0.75                    | 0.96                   | 0.60                                       | 2.01                            | 3.00                                | 3.04             | 1.61                    | 0.40                   |
| Kalyubia      | 2.00                       | 1.95                    | 1.30                   | 0.00                                       | 0.45                            | 0.99                                | 3.52             | 0.93                    | 0.58                   |
| Kafrel-Shelkh | 3.00                       | 0.59                    | 1.41                   | 1.06                                       | 2.39                            | 3.09                                | 4.00             | 1.67                    | 0.42                   |
| Gharbia       | 3.00                       | 1.31                    | 0.63                   | 1.30                                       | 2.30                            | 2.77                                | 3.84             | 0.54                    | 0.17                   |
| Menoufia      | 4.00                       | 0.65                    | 0.91                   | 1.30                                       | 2.15                            | 4.00                                | 3.68             | 0.87                    | 0.30                   |
| Behera        | 4.00                       | 0.75                    | 1.33                   | 1.06                                       | 1.30                            | 3.23                                | 3.68             | 0.65                    | 0.00                   |
| Ismailia      | 2.00                       | 0.77                    | 4.00                   | 3.92                                       | 1.16                            | 0.09                                | 2.24             | 2.20                    | 2.72                   |
| Giza          | 1.00                       | 2.99                    | 0.92                   | 3.38                                       | 0.00                            | 0.91                                | 3.52             | 2.60                    | 0.90                   |
| Beni Suef     | 2.00                       | 1.12                    | 2.46                   | 1.07                                       | 1.72                            | 2.27                                | 3.20             | 0.26                    | 0.36                   |
| Fayoum        | 1.00                       | 0.69                    | 2.58                   | 2.52                                       | 1.30                            | 2.18                                | 3.68             | 0.34                    | 0.56                   |
| Menya         | 2.00                       | 0.75                    | 1.71                   | 1.60                                       | 0.65                            | 1.77                                | 3.52             | 0.00                    | 0.91                   |
| Assuit        | 2.00                       | 0.81                    | 1.38                   | 2.10                                       | 0.34                            | 2.21                                | 3.84             | 0.77                    | 2.39                   |
| Souhag        | 4.00                       | 0.87                    | 1.52                   | 1.53                                       | 0.63                            | 1.92                                | 3.04             | 0.61                    | 0.13                   |
| Gena          | 3.00                       | 0.88                    | 2.47                   | 2.47                                       | 1.12                            | 1.18                                | 1.60             | 1.52                    | 0.00                   |
| Aswan         | 0.00                       | 0.00                    | 3.30                   | 2.52                                       | 2.97                            | 3.10                                | 0.00             | 0.79                    | 1.13                   |

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TABLE (5): FAMILY PLANNING PROGRAM EFFORT INDEX FOR THE EGYPTIAN GOVERNORATES.

| Governorate      | Index Value | Rank | % of the Maximum Possible |
|------------------|-------------|------|---------------------------|
| <b>Strong:</b>   |             |      |                           |
| Suez             | 23.73       | 1    | 65.92                     |
| Port Said        | 21.60       | 2    | 60.00                     |
| Alexandria       | 20.57       | 3    | 57.00                     |
| Damietta         | 19.12       | 4    | 53.11                     |
| Ismailia         | 19.09       | 5    | 53.03                     |
| <b>Moderate:</b> |             |      |                           |
| Menoufia         | 17.86       | 6    | 49.61                     |
| Kafrel-Sheikh    | 17.64       | 7    | 49.00                     |
| Sharkia          | 16.38       | 8    | 45.50                     |
| Giza             | 16.22       | 9    | 45.06                     |
| Behera           | 16.00       | 10   | 44.44                     |
| Gharbia          | 15.86       | 11   | 44.06                     |
| Assuit           | 15.83       | 12   | 43.97                     |
| Dakahlia         | 15.66       | 13   | 43.50                     |
| <b>low:</b>      |             |      |                           |
| Fayoum           | 14.85       | 14   | 41.25                     |
| Beni Suef        | 14.46       | 15   | 40.17                     |
| Souhag           | 14.25       | 16   | 39.58                     |
| Qena             | 14.25       | 17   | 39.58                     |
| Cairo            | 14.01       | 18   | 38.92                     |
| Aswan            | 13.81       | 19   | 38.36                     |
| Menya            | 12.91       | 20   | 35.86                     |
| Kalyubia         | 11.72       | 21   | 32.56                     |

with the lowest PE ( less than 15) includes eight governorates : Fayoum, Beni Suef, Souhag, Qena, Cairo, Aswan, Menya and Kalyoubia .

Since the maximum possible of the index is 36 scores, it is noticed that the observed values of the PE index are generally very low. The highest value of the index which is observed in Suez is only 65.9 percent of the maximum possible. The lowest value which is observed in Kalyoubia governorate is only 32.7 percent of the maximum possible and that of Cairo is 38.4 percent.

Also, it is noticed that the range of variation between governorates is small, but this is not the outcome of similar characteristics of the program effort but it is the outcome of different scores on the individual indicators as can be seen from table (4) as explained in the following examples .

(a) Within the "strong" category Damietta and Ismailia seem to have similar scores. However, Damietta scores higher in regard to IE&C, home visits and statistical reporting while the strength of the program in Ismailia is based on the availability of pharmacies, social marketing and the participation of the private sector.

(b) Within the "moderate" category we find that Assuit and Dakahlia have almost equal PE scores. Assuit scores , reltively high, in the availability of pharmacies and the participation of the private sector whild Dakahlia is more active concerning IE&C and social marketing.

(c) Within the "low" category Souhag and Qena are two governorates with seemingly equal program effort . In Souhag the score is higher for meetings, home visits and statistical reporting while in Qena the score is higher for the availability of pharmacies, IE&C and social marketing.

(d) The sitution of Cairo shows that the governorate is strong concerning accessibility as measured by women per centre and the proportion of women who have FP services in their place of residence and also concerning social marketing. However, there is a need for imporvemnt in holding meetings, IE&C and home visits.

## **5. THE RELATIONSHIP BETWEEN SOCIOECONOMIC SETTING, PROGRAM EFFORT, AND CONTRACEPTIVE PREVALENCE**

### **5.1 Descriptive Analysis**

The impact of socioeconomic setting (SES) and family planning program effort (PE) on contraceptive prevalence by governorate is summarised in cross tabulation form in table (6). The grand mean of CPR is 45.4 for all the governorates, with the range from 34.2 to 58.2 percent between the low and high socioeconomic setting groups of the governorates, and from 34.6 to 56.7 percent between the weak and strong program effort groups. The calculation of these means are based on unit weights for each governorate. However, applying weights to the data by the size of the female population in reproductive age gave similar results (Zohry, 1995). The table shows that prevalence increases in a regular manner as the governorate moves

TABLE 6  
CONTRACEPTIVE PREVALENCE RATE BY SOCIOECONOMIC SETTING AND PROGRAM EFFORT INDICES BY GOVERNORATE

| Socioeconomic Setting | Program Effort   |  | Mean   |
|-----------------------|--|--|--|
|                       | Strong   | Moderate   |  |
| High                  | Governorate CPR  | Governorate CPR  | 58.2   |
|                       | Alexandria<br>62.1<br>Port-Said<br>60.5<br>Suez<br>57.3<br>(60.0)                      | Dakahlia<br>52.8<br>(52.8)   | Cairo<br>58.1<br>(58.1)                      |
| Moderate              | Governorate CPR  | Governorate CPR  | 50.7   |
|                       | Damietta<br>53.4<br>Ismailia<br>50.2<br>(51.8)   | Gharbia<br>55.9<br>Menoufia<br>55.7<br>Giza<br>49.9<br>(53.8)                                    | Kalyoubia<br>57.9<br>Aswan<br>31.9<br>(44.9) |
| Low                   | Governorate CPR  | Governorate CPR  | 34.2   |
|                       | Sharkia<br>49.2<br>Kafrel-Sheikh<br>47.2<br>Behera<br>54.7<br>Assuit<br>28.2<br>(44.8) | Bent-Suef<br>29.2<br>Rayoum<br>33.3<br>Menya<br>21.9<br>Souhag<br>19.8<br>Qena<br>24.7<br>(25.8) | Mean<br>45.4                                 |

Note: Mean prevalence, at each level of program effort and socioeconomic setting, shown in parentheses.

from low to high socioeconomic setting with some exceptions. Also, prevalence increases in a regular manner as it moves from weak to strong program effort. In general, contraceptive prevalence increases with increased program effort within each SES category, and the same is true for the effect of SES within each program effort category. The principal conclusion from this tabulation is that increase of prevalence is associated with both SES and PE. Governorates with high socioeconomic setting and strong program effort have the highest CPR 60.0 (almost 50% higher than the overall mean) and the governorates with low socioeconomic setting and weak program effort have the poorest CPR 25.8 (almost 50% lower than the overall mean). Two exceptions were found. CPR is higher (52.8) for the moderate PE and High SES than in the weak PE and SES (58.1), while it was expected to be lower. Also, CPR is higher for the strong PE and moderate SES (51.8) than with moderate program effort and moderate SES (53.8), while it was expected to be lower.

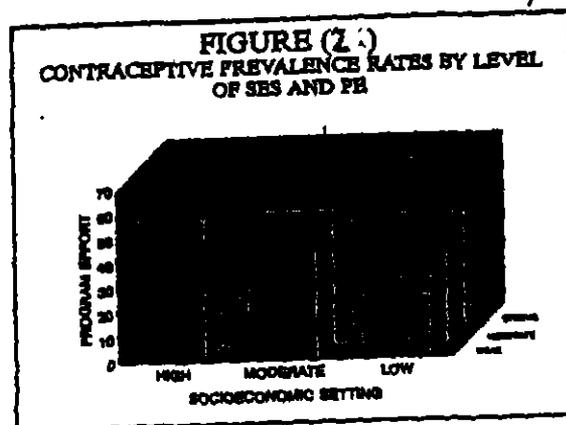
The effects of SES and PE are actually more complex than is suggested by this first look at table (6), because an interaction effect exists between these two determinants of contraceptive prevalence. As a consequence of this interaction, contraceptive prevalence that can be achieved with a given program effort in a particular governorate depends on the level of SES in that governorate which may be different than that achieved in another governorate with a different level of SES. Evidence of this interaction is available in table (6). For example, among the governorates with a high SES, a change in PE from "moderate" to "strong" would push prevalence up from 52.8 to 60.0 (about seven points only). On the other hand, among governorates with low SES, a change in PE from "weak" to "moderate" would push prevalence up from 25.8 to 44.8 (about 19 points). The impact of improvement in PE seems to be more pronounced in the governorates with low SES.

Similarly, among governorates with strong PE, a change in SES from "moderate" to "high" would push prevalence up from 51.8 to 60.0 (about eight points only). On the other hand, with weak PE, a change in SES from "moderate" to "high" would push prevalence up from 44.9 to 58.1 (about 13 points). It seems that the impact of improvement in SES is more pronounced in the governorates with weak PE. These relationships as can be seen in figure (2).

The key implications of the relationship between SES and PE and CPR can be summarised in the following points:

1. There is a strong positive relationship between SES and PE on one hand and contraceptive prevalence rates on the other.
2. The highest CPR is found with high SES and high PE, and the lowest one is found with low SES and low PE
3. CPR increases as the governorate moves from weak to strong PE, but the importance of PE increases with low SES. This means that improving PE among populations with low SES has more positive effect on prevalence than the case with high SES level.

4. Within each PE category, contraceptive prevalence increases as the governorate moves from low to high SES, but the importance of SES increases with low PE. That is, the effect of improving SES with low PE has more positive effect on prevalence than improving SES level with strong PE.



### 3.2 Statistical Analysis

#### 1. Regression Analysis

A more precise qualification of the separate roles of SES and PE requires a multiple regression analysis. The dependent variable is the CPR and the independent variables are SES index, PE index, and the interaction of PE with SES. The interaction variable is the product of PE and SES. The relationship is described by the equation:

$$CPR_i = a + b_1 SES + b_2 PE_i + b_3 SES_i * PE_i + e \quad \text{where:}$$

CPR = Contraceptive Prevalence Rate;

SES = Socioeconomic setting Index

SES \* PE = The interaction between socioeconomic Setting and Program Effort Index;

e = error term, and

i = denotes governorate

The results of the regression are presented in table (7). The unstandardized regression coefficient for the index of SES is 89.1556 (standard error = 30.44) which is statistically significant at  $p=0.01$ . The corresponding coefficient for the index of PE is 1.8576 (standard error = 1.01), which is statistically significant at  $p=0.1$ . The interaction between SES and PE is also statistically significant at  $p=.05$ , with a coefficient equal to -4.0350 (standard error = 1.83). The variables in the model explain 67% of the variations in the CPR among the governorates. The significance of the whole model is measured by F statistics, which is statistically significant at  $p = .01$ . the regression equation can be written as follows:

$$CPR = 17.67 + 89.16 SES + 1.86 PE - 4.04 SES * PE$$

Apparently, when program effort and socioeconomic setting effects are considered jointly, the role of program effort as a determinant of CPR can be substantial. Consider, for example the case of a governorate with a low level of SES ( e.g. SES = -.58), and a very large change in program effort takes place ( e.g. from PE = 14 to PE = 24). Using the parameters in table (7), at PE = 14 the CPR is 24.7 and at PE = 24 it increases to 66.7 . Thus, the estimated CPR effect of improving program effort in a low SES is 42.0.

TABLE ( 7 )

REGRESSION ANALYSIS OF THE FAMILY PLANNING PROGRAM  
EFFORT AND SOCIOECONOMIC SETTING ON CONTRACEPTIVE  
PREVALENCE RATE

| EXPLANATORY<br>VARIABLES    | UNSTANDARDIZED<br>REGRESSION<br>COEFFICIENT |
|-----------------------------|---|
| Socioeconomic Setting Index | 89.1556***<br>(30.4392)                     |
| Program Effort Index        | 1.8576*<br>(1.0052)                         |
| Interaction Term            | -4.0350**<br>(1.8341)                       |
| Constant                    | 17.6646                                     |
| R <sup>2</sup>              | .67   |
| F Ratio                     | 11.4296***                                  |

\*\*\* Significant at P .01  
\*\* Significant at P .05  
\* Significant at P .10

**2. Path Analysis**

The path model is a set of simultaneous linear regression equations, which specify the relations between the variables in the experiment. It specifies quantitative relations and gives direct and indirect effects. Each equation of the Path model represents a causal link rather than a more empirical association, that is in contrast to a regression model where each equation represents the conditional mean of the dependent variable in that equation as a function of the explanatory variables (Abdel- Ati, 1993; Asher, 1983).

The path equations are given as :

$$PE = p_{21} SES + p_{2u} X_u$$

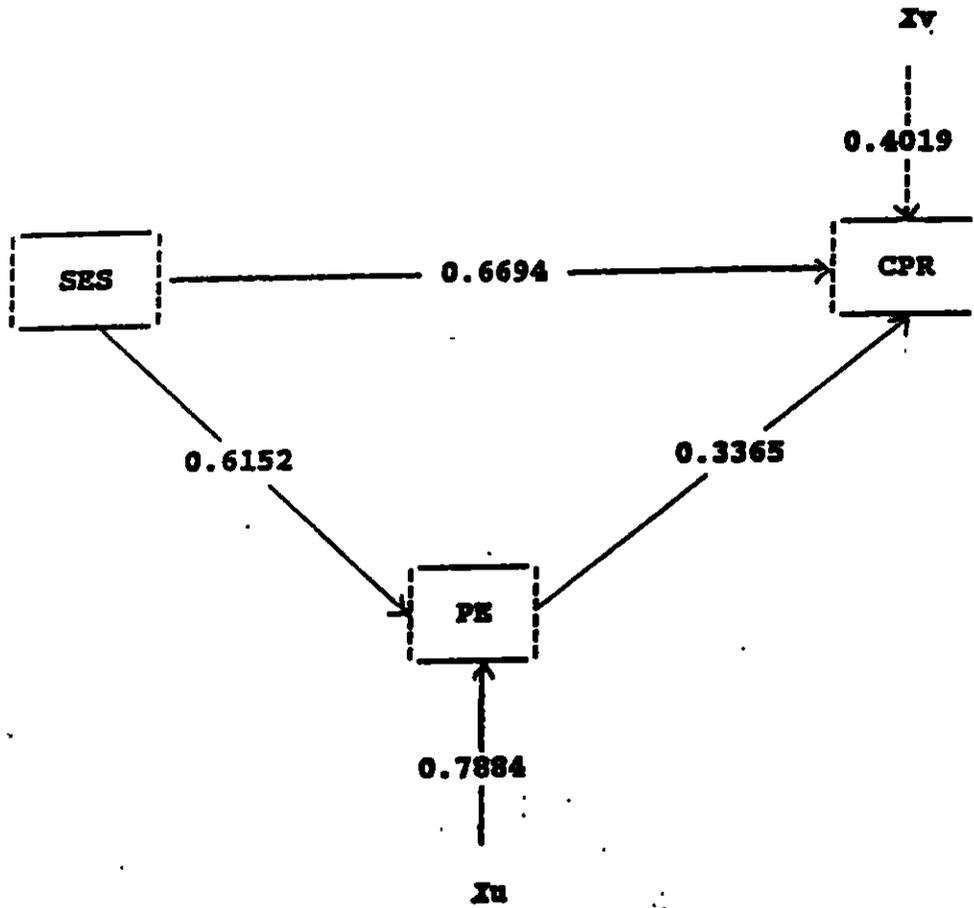
$$CPR = p_{01.2} SES + p_{02.1} PE + p_{0v} X_v$$

where  $p_{21}$  ,  $p_{2u}$  ,  $p_{01.2}$  ,  $p_{02.1}$  and  $p_{0v}$  are the path coefficients to explanatory variables, and  $X_u$  and  $X_v$  are the unexplained variations.

The path diagram is given in figure (3), the arrows indicate the assumed direction of effect, with the vertical arrows indicating unexplained or residual effects. According to this model, socioeconomic setting has more direct effect on contraceptive prevalence ( 0.6694) as compared with the effect of program effort (0.3365). However, this understates the total effect of socioeconomic setting in as much as it also operates through program effort. The indirect effect of the socioeconomic setting on CPR - which is the effect of SES through PE- is estimated by multiplying the path value from socioeconomic setting to program effort (0.6152) by (0.3365), which is equal to 0.2070. Thus, the combined direct and indirect effect of SES is 0.6694 + 0.2070 which equal to 0.8764. the direct and indirect effect of SES and PE and CPR are given in table (8). The results of the path analysis shows that the total effect of SES on CPR is much higher than that of PE ( 0.8764 vs. 0.3365).

The path coefficients of unexplained variance for contraceptive prevalence is modest (0.4019), but unexplained variance for program effort is relatively large (0.7884). That is, variations in CPR are reasonably explained by variation in SES and PE , while variations in PE are not adequately explained by variations in SES.

**FIGURE (3)**  
**THE STRUCTURE AND THE RESULTS OF PATH ANALYSIS MODEL**



## 6. CONCLUSIONS

The results of statistical regression and path analysis are consistent with the descriptive presentation. The conclusion to be drawn is that socioeconomic setting is associated with much of the variance in contraceptive prevalence in the Egyptian governorates, and that the socioeconomic setting and program effort combined are associated with a greater amount of the variance in prevalence. Aiming to achieve a balance between SES and PE the following points may be considered:

1. All of the governorates in Upper Egypt have a low level of SES as well as a weak level of PE, with the exception of Aswan ( moderate SES) and Assuit (moderate PE). This situation calls for continued improvement in the availability, accessibility and quality of family planning services in Upper Egypt. Improvement in the socioeconomic setting is essential for creating a desire for small families and for contraceptive use. It is also important for providing a suitable climate for enhancing the efficiency of the family planning activities.
2. Most of the governorates in Lower Egypt have a moderate level of SES and an almost moderate level of PE. More emphasis should be made for the improvement of the socioeconomic setting in these areas so as to stimulate a demand which can balance the existing level of family planning services. However, special attention is needed for the improvement of the family planning program effort in Dakahlia, Gharbia, Menoufia and Kalyoubia.
3. Special efforts are needed for the improvement of family planning program effort in Cairo.

**Appendix**

**STATISTICAL DESCRIPTION OF SOCIOECONOMIC VARIABLES.**

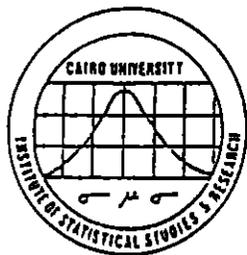
| <u>Variable V1 (Literacy Rate for Population 10+):</u>   |         |          |           |
|--|---------|----------|-----------|
| Mean   | 49.771  | Std err  | 2.540     |
| Median   | 51.900  | Range    | 35.100    |
| Std dev  | 11.639  | Variance | 135.457   |
| Minimum  | 33.900  | Maximum  | 69.000    |
| <u>Variable V2 (Gross Enrolment Ratio, 1990):</u>        |         |          |           |
| Mean   | 76.886  | Std err  | 2.156     |
| Median   | 78.900  | Range    | 35.200    |
| Std dev  | 9.880   | Variance | 97.607    |
| Minimum  | 58.600  | Maximum  | 93.800    |
| <u>Variable V3 (Life Expectancy, 1989):</u>              |         |          |           |
| Mean   | 63.433  | Std err  | .404      |
| Median   | 63.600  | Range    | 7.200     |
| Std dev  | 1.850   | Variance | 3.424     |
| Minimum  | 60.300  | Maximum  | 67.500    |
| <u>Variable V4 (Infant Mortality Rate, 1989):</u>        |         |          |           |
| Mean   | 39.238  | Std err  | 2.540     |
| Median   | 38.000  | Range    | 43.000    |
| Std dev  | 11.640  | Variance | 135.490   |
| Minimum  | 21.000  | Maximum  | 64.000    |
| <u>Variable V5 (Per Capita Income, 1990/91):</u>         |         |          |           |
| Mean   | 994.767 | Std err  | 66.123    |
| Median   | 905.500 | Range    | 987.900   |
| Std dev  | 303.014 | Variance | 91817.245 |
| Minimum  | 730.200 | Maximum  | 1718.100  |
| <u>Variable V6 (Percent Working in Agriculture 15+):</u> |         |          |           |
| Mean   | 38.333  | Std err  | 4.049     |
| Median   | 41.600  | Range    | 56.600    |
| Std dev  | 18.555  | Variance | 344.299   |
| Minimum  | 4.800   | Maximum  | 61.400    |
| <u>Variable V7 (Percent Urban):</u>                      |         |          |           |
| Mean   | 43.029  | Std err  | 6.549     |
| Median   | 26.200  | Range    | 79.900    |
| Std dev  | 30.010  | Variance | 900.596   |
| Minimum  | 20.100  | Maximum  | 100.000   |

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