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# Fertility Transition in Oman and its Economic Impact

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**Abstract**

Fertility analysis is of central importance in Demography as births are a vital component of population growth. The study of fertility also provides important information about women's reproductive behaviour and attitudes. This paper deals with the Fertility transition in Oman. Fertility transition in Oman is investigated by using the 1995 Oman Family Health Survey data. A close investigation of the fertility data indicate that fertility has been declining since 1995 despite the fact that fertility is still considerably high with about five children per woman. The proximate determinants of fertility developed by Bongaarts were also used to assess their contributions in fertility transition. The Bongaarts indices show that among the four principal determinants, lactational infecundability contributed most to fertility transition in Oman followed by marriage. The fertility transition in Oman can be attributed to the socio economic development such as increased education of women and empowerment of women which will increase the age at marriage of females in future contributing to the small family size in Oman. This study will provide important policy direction for future population control planning of Oman.

**Keywords:** fertility, mortality, infecundability, proximate determinants.

## INTRODUCTION

Oman is passing through a crucial phase of social, economic and demographic transition. The fertility rate in Oman has declined from more than 8 births per woman in late 1980s to about 5 births per woman in 2000 (Sulaiman, et al., 1992, Sulaiman, et al., 2000, Eltigani, 2001a, 2001b). On the other hand, infant mortality has declined from a very high rate of 140 per 1000 live births in early seventies to 14 per 1000 live births in mid nineties (UNDP, 1998). However, despite the recent decline in fertility, Oman is still a high fertility country and is passing through the early stages of demographic transition. The age-structure of the population indicates a very young population with more than 40 percent of the population below age 15 and, thus, having high potential of future population growth. In Oman, rapid improvement in educational attainment, particularly among females, rise in female age at first marriage, significant improvement in women status, rapid urbanization, improvement in health and survival of young children and economic development are the determinants of fertility decline. These will also play significant role in fertility transition in future. This article provides an analysis of the major proximate determinants of fertility and estimates their fertility influencing effects using the Bongaarts model. We also investigate the effects of socioeconomic development on declining trends in fertility in Oman. The findings of the study have important policy implications for population planning and economic development of Oman.

## METHODOLOGY

This study utilizes secondary data from different sources. The major data source is the Oman Family Health Survey (OFHS)-95. The OFHS-95 covered a nationally representative sample of 6,103 Omani households with 51,563 population of which 26,031 were male and 25,532 female. Ever married women under 50 years of age were considered as eligible respondents. From the selected households, 6,405 eligible women were successfully interviewed.The sample households were selected following a two-stage stratified cluster sampling design. Administratively, Oman is divided into eight governorates (or region) and regions are divided into wilayat. Each wilayat is divided into Census Enumeration Areas (EA) consisting on an average of 100 households. The EAs were considered as the primary sampling units (PSU). The 1993 Oman Population Census provided the sampling frame of the EAs and households. At the first stage, 264 EAs from 52 wilayat were selected following probability proportional to size (PPS) sampling scheme and at the second stage, 25 households were selected systematically from each selected EAs.

### Bongaarts Proximate Determinants of Fertility

To quantify the effects of the four major proximate determinants of fertility (i.e. marriage, contraception,

lactational infecundability and induced abortion) on total fecundity (TF), which is the maximum hypothetical fertility level in the absence of the influence of any proximate determinants. Bongaarts (1978) developed the model where he showed TFR is equal to the product of the four major proximate determinants multiply by the total fecundity rate which is according to the Bongaarts is 15.3.

The Bongaarts proximate determinants of fertility is

$$C_m = \frac{Total\ fertility rate(TFR)}{Total\ marital\ fertility rate(TMFR)} \quad (3.1)$$

The index of contraception, $C_c$, measures the effect of contraception on the risk of conception or pregnancy.

The index is calculated as:

$C_c = 1 - 1.08 \times u \times e$ (3.2)

where, u is the current contraceptive prevalence rate (CPR) and e is the average use-effectiveness of contraception which is calculated as the weighted average of the method-specific use-effectiveness levels:

| Contraceptive methods ($u_i$) | Use-effectiveness ($e_i$) |
|---|---|
| Pill | 0.90 |
| IUD | 0.95 |
| Injection | 0.99 |
| Sterilization | 1.00 |
| Others | 0.70 |

The method specific use-effectiveness level ($e_i$) is adopted from the Bongaarts model. The weights are, in effect, equal to the proportion of women using a particular birth control method (i.e. $u_i$).

The index of lactational infecundability, $C_i$, measures the effects of postpartum amanorrhoea and breastfeeding on fertility. The index is calculated as

$$C_i = \frac{20}{18.5 + i} \quad (3.3)$$

where, i is the average number of months of postpartum infecundability for currently married women, and 20 is the average birth interval (in month) in the absence of breast feeding and postpartum abstinence, while 18.5 is the sum of 7.5 months of waiting time to conception, 2 months of time added by spontaneous intrauterine mortality and 9 month of full-term gestation. In the absence of breastfeeding, the average duration of postpartum infecundability is assumed to be 1.5 months. The OFHS-95 lacks direct estimate of the duration of post-partum infecundability. An indirect estimate of the duration of postpartum infecundability can be obtained from the duration of breastfeeding using the following fitted model relating to breastfeeding and postpartum infecundability:

$$i = 1.753 e^{0.1396 B - o.001872 B^2} \quad (3.4)$$

where, i is the average duration of postpartum infecundability and B is the average duration of breastfeeding. According to the OFHS-95, the average duration of breastfeeding was 19.1 months which gives (using above equation) an estimate of the average duration of postpartum infecundability as 12.7 months. $C_a$ is assumed to be 1 in the absence of any information on abortion. The total fecundity (TF) has been observed to vary from 13 to 17 births per woman, with an average of about 15.3 births per woman according to the Bongaarts.

Table 1: Age-specific fertility rates (ASFR) (per 1000 women), total fertility rate (TFR) and general fertility rate (GFR) and crude birth rate (CBR), Oman 1995.

| Age group | Age-specific fertility rate/1000 women | | |
|---|---|---|---|
| | Urban | Rural | Total |
| 15-19 | 75 | 107 | 86 |
| 20-24 | 249 | 318 | 270 |
| 25-29 | 316 | 364 | 332 |
| 30-34 | 286 | 325 | 300 |
| 35-39 | 210 | 241 | 222 |
| 40-44 | 105 | 130 | 114 |
| 45-49 | 78 | 103 | 86 |
| | | | |
| TFR | 6.6 | 7.95 | 7.05 |
| GFR | 180 | 219 | 194 |
| CBR | 37.5 | 41.1 | 38.8 |

Source: Oman Family Health Survey -1995.

**Rural Urban Differential in Fertility**

Rural women have significantly higher fertility than urban women (7.95 vs 6.60). Fertility rate is not uniform across the region. Fertility rate is lowest in Muscat (5.1 births per woman) and highest in Al-Batinah (7.7 births per woman),

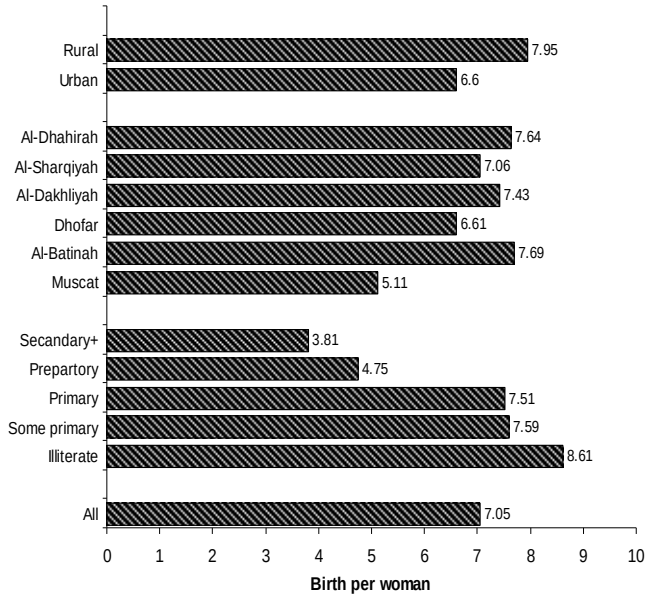


Figure 1: Total fertility rates by place of residence, region of residence and women education, Oman 1995. . Source: Oman Family Health Survey -1995.

Table 2: Percentage distribution of currently married women according to desire for more children and number of living children.

| No. of living children | Desire for more children | | | | |
|---|---|---|---|---|---|
| | Wants more | Wants no more | Undecided | Declared in fecund | Total |
| 0 | 87 | 2 | 4.9 | 6.1 | 100 |
| 1 | 85.1 | 8.9 | 4.2 | 1.8 | 100 |
| 2 | 74 | 15.2 | 7.6 | 3.2 | 100 |
| 3 | 63.9 | 23.7 | 8.5 | 3.9 | 100 |
| 4 | 55.1 | 27.8 | 10.9 | 6.2 | 100 |
| 5+ | 26.9 | 54.5 | 12.2 | 6.4 | 100 |
| | | | | | |
| Total | 47.2 | 37.4 | 10 | 5.4 | 100 |

Source: Sulaiman et al (2000), Table 10.1, pp 144

Table 3: Comparison of ideal and actual family size and mean ideal family size among the currently married women by number of living children

| Number of living children | Ideal = actual number | Ideal > actual number | Ideal < actual number | Total | Mean ideal family size |
|---|---|---|---|---|---|
| 0 | 0 | 100 | 0 | 100 | 4.5 |
| 1 | 1.6 | 98.4 | 0 | 100 | 4.5 |
| 2 | 7.4 | 92.4 | 0.2 | 100 | 4.9 |
| 3 | 14.1 | 84.7 | 1.2 | 100 | 5.1 |
| 4 | 26.5 | 69.5 | 4.1 | 100 | 5.6 |
| 5+ | 39.9 | 35.3 | 24.9 | 100 | 7.6 |
| | | | | | |
| Total | 26.7 | 59 | 14.3 | 100 | 6.4 |

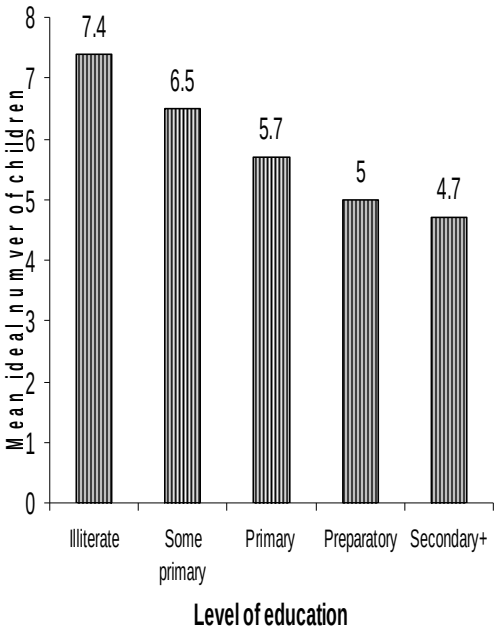


Figure 2: Mean ideal family size by level of education

Table 4: Age-specific fertility rates (ASFR) per 1000 women and total fertility rates (TFR) from different surveys

| Age group | 1988/89 | | 1995 | | 2003 | | % change | | |
|---|---|---|---|---|---|---|---|---|---|
| | ASFR | Relative % of ASFR | ASFR | Relative % of ASFR | ASFR | Relative % of ASFR | 1989-1995 | 1995-2003 | 1989-2003 |
| 15-19 | 220 | 12.8 | 86 | 6.1 | 14 | 1.4 | -60.91 | -83.72 | -93.64 |
| 20-24 | 383 | 22.3 | 270 | 19.1 | 102 | 10.1 | -29.5 | -62.22 | -73.37 |
| 25-29 | 382 | 22.2 | 332 | 23.5 | 272 | 26.9 | -13.09 | -18.07 | -28.8 |
| 30-34 | 323 | 18.8 | 300 | 21.3 | 230 | 22.8 | -7.12 | -23.33 | -28.79 |
| 35-39 | 251 | 14.6 | 222 | 15.7 | 213 | 21.1 | -11.55 | -4.05 | -15.14 |
| 40-44 | 117 | 6.8 | 114 | 8.1 | 136 | 13.5 | -2.56 | 19.3 | 16.24 |
| 45-49 | 43 | 2.5 | 86 | 6.1 | 43 | 4.3 | 100 | -50 | 0 |
| | | | | | | | | | |
| TFR | 8.6 | 100 | 7.05 | 100 | 5.05 | 100 | -18.02 | -28.37 | -41.28 |
| Mean age at child bearing: | | | | | | | | | |
| | 29.2 | | 31.1 | | 33 | | | | |

Table 5: Percentage of Women who were first Married by Exact Ages and Median Age at First Marriage by Current Age, Oman 1995

| Current age | Median age at first marriage |
|---|---|
| 15-19 | a |
| 20-24 | 18.6 |
| 25-29 | 14.8 |
| 30-34 | 13.9 |
| 35-39 | 13.6 |
| 40-44 | 13.7 |
| 45-49 | 13.5 |
| | |
| 20-49 | 15.6 |

Table 6: Percentage distribution of currently married women by method specific current use of family planning methods and method mix

| Method | Proportion using | Proportional share of total use |
|---|---|---|
| Any method | 23.7 | |
| Any modern method | 18.1 | 76.4 |
| Pill | 6.1 | 25.7 |
| IUD | 2.2 | 9.3 |
| Injectables | 3.8 | 16 |
| Condom | 1.5 | 6.3 |
| Female sterilization | 4.5 | 19 |

Table 7: Estimates of Selected Reproductive Measures and Derived Indices of Proximate Determinants, Oman 1995

| Proximate determinants | |
|---|---|
| A. Reproductive measures | |
| TFR | 7.05 per woman |
| TMFR | 9.8 per woman |
| CPR | 23.7 percent |
| Contraceptive use-effectiveness | 0.87 |
| Mean Postpartum infecundability | 12.2 months |
| B. Model Indices | |
| Marriage ($C_m$) | 0.72 |
| Contraception ($C_c$) | 0.78 |
| Infecundability ($C_i$) | 0.64 |

## RESULTS AND CONCLUSION

The Bongaarts indices show that in 1995, lactational infecundability has the highest fertility reducing effect, accounting for 36 percent ($C_i$ = 0.64) reduction of total fecundity (TF). Marriage emerges as the second most important fertility reducing factor, accounting for 28 percent ($C_m$ = 0.72) reduction in actual fertility levels below marital fertility. Contraception has the lowest fertility reducing effect, accounting for a 22 percent ($C_c$ = 0. 78) reduction of natural fertility relative to marital fertility. In recent years, massive economic and social developments are taking place in Oman. The present Government of Oman, aided by the oil export revenues is implementing various economic and social development programs for the Omani population. Prior to the commercial exploitation of oil in late 1960s, the economy of Oman consisted of subsistence agriculture and fishing. Social and economic infrastructure development was almost non-existent. For example, in the late 1960's Oman had only three schools, two hospitals and only ten kilometers of paved roads. Within two decades by early 1990s, Oman has been transformed into a modern state with all modern facilities and infrastructures.

The standard of living has improved significantly since the mid-1970s. The political stability that has been established in Oman over the past 20 years have enabled the Oman Government to design and implement a successful and wide ranging modernization programs that influenced all aspects of the life of Omani people. As part of modernization drive, the government of Oman has put much emphasis in the expansion of education to both males and females. As a result the net enrolment rate for females aged 6-10 has increased from 5 percent in 1970s to 92 percent in mid-1990s and the gender gaps in education at all levels is reduced. In recent time, due to increase in women education and increased social status in Oman, women's control over their own reproductive lives and their empowerment have increased. This would clearly have a major impact on fertility as well as on the health of the mothers and the growth and survival of their children.

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