Below Replacement fertility in Kerala : So What ?

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1. Introduction

Kerala, a small state in the southern most part of India, has attained below replacement fertility during early 1990s. It has several other distinctions among the other states (provinces) in India. Kerala has the lowest crude death rate (around 6 per thousand), lowest infant mortality (13 per 1000 live births), highest life expectancy at birth (73 years) and highest literacy rate (91 per cent). The case of Kerala is very interesting in the sense that the demographic transition achieved is in the absence of a reasonably high level economic development as prescribed in the so-called theory of demographic transition in the West. Kerala, at least, portrays a society of a high magnitude of human development. What are the implications of this fertility scenario for the future of Kerala and that is the focus of this paper.

The first part of the present analysis provides the estimates of the momentum of population growth. The data required for the study were obtained from the Census of India Publications and various reports of the Sample Registration System (RGI). The data on fertility and mortality rates and sex ratio at birth were obtained from the annual reports of the Sample Registration System, Registrar General of India, from 1981 through 1994. Using the age specific death rates, the life table for females were constructed. From the constructed life tables, the survival rates required for population projections are

estimated. The *cohort-component* method (Shryock et. al, 1976) is used for population projection. For estimating the momentum of population growth, it is assumed that fertility rates remain constant at exact replacement levels; mortality rates remain constant at observed levels and population is closed to migration.

We use the recent generalised method of estimating momentum for any observed population by Kim and Schoen (1991) for the present study. Population momentum is estimated as the ratio of the ultimate stationary population size to the initial observed size.

$$Momentum = \frac{Ultimate\ Stationary\ Population\ Size}{Initial\ Population\ Size}$$

The initial population is projected in five-year leaps for about 150 years assuming constant observed mortality level and replacement level fertility because after about 150 years the population is virtually stationary. The whole analysis pertains to the female population. Keyfitz (1977) has cited the reasons for stressing the female model.

2. Past trends in fertility and mortality.

As the projections are based on past trends in fertility and mortality, it is important that we assess the declining trend. Table 1 shows the trends in total fertility rate, crude death rate and infant mortality rate in India and Kerala.

Table 1: Trends in Total Fertility Rates, Crude death rate and Infant Mortality rate, India and Kerala, 1981 to 1994

States	Total fertility rate			Crude death rate			Infant mortality rate		
	1981	1991	1994	1981	1991	1994	1981	1991	1994
Kerala	2.8	1.8	1.7	6.6	6.0	6.1	37	16	16
India	4.5	3.6	3.5	12.5	9.8	9.3	110	79	74

Source: Various reports of the Sample Registration System, 1981 to 1994, Registrar General of India publications

Kerala became the first state in India to bring down its TFR to 2.1 in the year 1989. Kerala's fertility transition of consistent declines in fertility began before the 1970s. Ratcliffe (1978) attributed this decline to the structural changes in the political economy, land reforms, minimum wages in agriculture and large public investments by the state Government in primary and secondary education. Zachariah (1984) and Nair (1997) argued that primary developments in public health and universal education over a long period of time, increase in the number of surviving children together with parent's perceived higher cost of educating their children raised the cost of child rearing in Kerala and paved the way for successful practice of family planning methods. Rise in female literacy and educational level of girls and rise in age at marriage improved the health care of children within the family. Nair (1997) attributes the decline in fertility to the high level of human development achieved in Kerala in recent years.

Table 2 shows the momentum of population growth in India and Kerala. While Kerala has the potential to add 59 per cent to the population as on 1987, India, as a whole, has a growth potential of 34 percent only.

Table 2 : **Momentum of Population growth in India and Kerala.**

State	*NRR*	*Momentum*
Kerala (1987)	**1.00**	**1.59**
India (2019)	**1.01**	**1.34**

Momentum of population growth in Kerala has been enormous. When fertility in Kerala reached replacement levels in 1987 corresponding to a TFR of 2.16, the state still had a potential to increase by another 59 per cent only due to momentum. This is basically due to the faster decline in fertility and mortality in Kerala in the recent past.

The momentum related demographic aspects which have their impact on health situation in any country would be (i) population size, (ii) population density and (iii) age

structure. The following table presents the change in population size and density during the next two decades in Kerala.

Table 3. Momentum related population growth in Kerala.

Pop. Growth	Kerala	
	2001	2021
Population (in millions)	31.8	39.6
Population Density (Sq.km)	860	1018

As Table 3 shows, there is a tremendous inbuilt growth due to momentum and density in Kerala. Density will take a staggering level of more than 1000 persons per sq. Km during 2021 itself. This can have far reaching consequences in the areas of environmental health and the public health infrastructure needs. The small state looks already overcrowded and with such projected massive increase due to the inbuilt momentum, it could be difficult to meet the needs of the population in terms of shelter, employment, etc. The ill effects of this growth on environmental deterioration and consequent changes in morbidity patterns will have to be dealt with by the policy makers.

3. Changing Health Environment

Table 4 presents certain indicators concerning the population and public health infrastructure in India and Kerala during 1991. Available hospital beds per 100,000 population is 26.5 in Kerala whereas, the levels at the national level is fairly low. This is the same case for the availability of hospitals also.

Table 4: Population and public health infrastructure in India and Kerala, 1991.

Indicator	India	Kerala
Medical Manpower (Doctors in Primary Health centres)	3.6	5.6
Para Medical Manpower	43.7	62.7
Beds per 10,000 population	7.0	26.5
Hospitals per 100,000 population	1.32	7.02
Primary Health Centres per 100,000 population	3.6	4.3
Percapita Medical and Public Health Expenditure (In constant 1980-1 prices in Rupees)	4.6	33.8
Doctors/population ratio (per 100,000 pop)	47.19	56.72

Sources : Economic and Political weekly, Vol. XXX No. 15, 1995

As mentioned earlier, Kerala is a low mortality population. Some authors have noted that Kerala also has the highest morbidity rates (Kumar and Vaidyanathan 1988, Kannan et. al 1991). Murray (1996) attributes this to the changing perceptions of illness and health, the aging of population due to demographic transition, declining case fatality rates, and frailty or selection effects. It may be added that the high literacy, accessibility of health providers and, above all, the rights oriented perception of public utility services of the common man in Kerala are other reasons for the reported high morbidity. The shift in age composition towards an increasing proportion of the aged would be more pronounced when population momentum induced growth begins. Population

momentum has been shown to be linearly related to aging (Kim and Schoen 1998). The inevitable increase in the morbidity burden on the health care system is also bound to increase with this change.

Table 5. Percent of aged (60+) during 1991-2021 in Kerala.

State	1991	2001	2021
Kerala	9.1	10.2	15.5

Table 5 shows the pattern of change in aging during the next two decades in Kerala. It is likely to have the highest proportion of aged in 2021 among the states in India. Although the proportional increase is not alarming , the absolute population size it implies is very large. The health care expenditure for this segment of population is bound to increase drastically over the next quarter of the century. Are the federal governments in the states prepared for this eventuality? It is a truism that the policy makers and planners are not yet caught up with this situation although social scientists and public health professionals are engaged in issuing warning signals atleast since the last decade in India (Nair, 1987 among others). Even in a socially advanced state like Kerala, geriatrics has not developed as a branch of medicare. Furthermore, the socio-economic and emotional aspects of the aged population are also worthwhile concerns. The changing age structure due to momentum will favour a higher old age dependency ratio. In this aspect also the state intervention will become absolutely necessary and unavoidable.

4. Conclusion

Demographic transition in Kerala in the 20th century defies conventional wisdom among policy makers and social scientists in that it was not *development induced* as witnessed in the West in the late 19th and early 20th centuries. In a way, the Kerala experience brings forth adequate raw materials for yet another theoretical formulation in the explanation of fertility transition in developing countries. The human development model in explaining

fertility transition in Kerala appears rational and appealing.

Population growth due to momentum is expected to be very strong in Kerala as it would be witnessing a massive increase in numbers in its transition to stationarity (59 percent) compared with any other state in India.

Regarding the availability of medical and paramedical manpower in the health centres, Kerala's position is above national level. Available hospital beds per 100,000 population is 26.5 in Kerala whereas, the levels at the national level are fairly low. However, the current levels of health infrastructure may not be sufficient to take care of the changing morbidity patterns. Further, when there is potential for the population to increase by about 59 per cent in Kerala in the coming decades, massive public investment is needed to cope up with the emerging situations.

Population density in Kerala will take a staggering level of more than 1000 persons per sq. Km during 2021 itself. This can have far reaching consequences in the areas of environmental health and the public health infrastructure needs. Environmental pollution of all kinds is on the increase at an incredibly high degree even today. Further, the national policy of industrial location lacks pragmatism and vision.

Kerala looks already overcrowded and with such projected massive increase of population due to the inbuilt momentum despite very low fertility, it could be difficult to meet the needs of the population in terms of shelter, employment, etc. The ill effects of this growth on environmental deterioration and consequent changes in morbidity patterns will have to be dealt with by the policy makers.

The shift in age composition towards an increasing proportion of aged would be more pronounced as the growth due to population momentum has already begun. The impact of inevitable increase in the morbidity burden on the health care system will be too high

in Kerala.

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