

APPENDIX C

WHO IS HAVING TOO FEW BABIES?

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In an earlier article ("When couples have fewer than two", *The Sunday Times*, June 15) I discussed the impact of fertility trends in Singapore on the future size of our population.

Singapore women, as a whole, have been having too few babies to keep our population from declining in the future. But there are differences in birth patterns among women from the different ethnic and educational groups.

For instance, while Malay and Indian women have been having children at a rate of about two per family (the population replacement rate), Chinese women, on average, have been having fewer and fewer.

I will consider the implications of this trend later in the article. First, in order to understand better the population problem that faces Singapore, we need to look at some fertility figures.

Those who watch population trends find a number called the GRR (gross reproduction rate) to be a particularly useful measure of fertility.

It is the average number of daughters a woman will produce during her child-bearing years — provided that she lives through the entire period.

Of course, not all women live until the end of their child-bearing period. So the actual average number of daughters born to women in the population can be calculated from the GRR by taking into account the death rate of women in this age group.

The resulting figure is the net reproduction rate (NRR).

If the NRR is exactly 1 (commonly referred to as the two-child family level, since each woman has one son and one daughter on the average), we can expect the population to replace itself in the future.

If it is less than 1, too few daughters are being born for the population to replace itself.

If it is more than 1, the size of the population will grow, since there will be more daughters than mothers.

When the NRR is exactly 1 in Singapore, the GRR will be about 1.025. This is the replacement fertility level.

Women in Singapore have been having fewer and fewer children since 1958. This decline continued into the early 1970s. In 1970, the average woman had 1.505 daughters over her lifetime.

In 1975, when the fertility rate first dropped below the replacement level of 1.025, the average woman had 1.006 daughters.

Now, if Singapore is to attain the goal of stabilizing its population in the future, two conditions have to be met.

The first is that fertility must drop to replacement level. This it did in 1975.

But the second condition for a stationary population is that fertility needs to remain close to replacement level indefinitely.

This condition has not been met, as fertility has continued to decline after 1975. It fell from 1.006 in 1975 to the low of 0.766 in 1983, after which it went up slightly to 0.779 in 1985.

We can certainly expect fertility to remain below replacement level in 1986 and over the next few years.

Since 1975, our women have been producing fewer children than necessary to keep the population from declining in the future.

For each year since 1975, we can calculate the number of additional births that would have been required to ensure a complete renewal of our population.

First we estimate the number of births that would have occurred each year if replacement fertility (one daughter per woman) had prevailed.

Then, we compare the estimate with the actual number of births for each year.

The difference between the figures for any particular year gives an idea of the extent to which our women have not been producing enough children to ensure that the population will replace itself.

In 1974, there were 43,268 births as compared with the 39,074 births required for replacement. This gives a surplus of 4,194 births. Before 1974, the surpluses were even greater.

In 1975, when fertility dropped below replacement level, the actual number of births was 39,948, a shortfall of 755 below the 40,703 births required for replacement.

In that year, we were therefore 1.9 per cent short of the number of births needed to ensure the future replacement of our population.

As fertility continued to decline after 1975, the birth shortfall became more serious. It increased to 9,018 or 18 per cent in 1980 and to 13,416 or 24 per cent in 1985.

For the whole period 1975–1985, the shortfall was no less than 92,252 births.

We will obviously continue to experience a birth shortfall as long as our fertility remains below replacement level.

It is therefore necessary to take action now to reduce, and eventually to eliminate, the shortfall by making changes to our population control programme so that fertility can move back to replacement level.

Let us now look at the differences in fertility among the three main ethnic groups.

When overall fertility in Singapore first fell to slightly below replacement level in 1975, the fertility of every one of the three ethnic groups fell to near replacement level (1.000 for the Chinese, 1.032 for the Malays and 0.956 for the Indians).

All the three ethnic groups have responded well to our population control programme in the past, and have contributed to the attainment of replacement fertility at the national level.

The fertility of all three groups has remained below replacement level in practically all of the past 11 years.

But the three ethnic groups have differed in the amount by which their fertility has fallen below replacement level.

During the period 1975–1985, while the fertility of Malays and Indians has shown relatively small deviations from replacement level, the fertility of the Chinese has fallen progressively below this level.

In 1985, Malay fertility was 1.034, about 0.9 per cent above replacement level. Indian fertility was 0.939, about 6.1 per cent below replacement level. In contrast, Chinese fertility, at 0.702, was about 31.5 per cent below replacement level.

What was the impact of these differences in fertility on the distribution of births among the ethnic groups? The actual distribution in 1985 was 69.1 per cent Chinese, 19.1 Malays and 7.7 per cent Indians.

Now, if the Chinese women had produced babies in 1985 at a rate required to satisfy replacement fertility, there would have been about 43,125 births to Chinese women instead of the actual 29,355 births.

Assuming that the birth patterns of Malay and Indian women had remained the same, the percentages would then have been 76.7 per cent Chinese births, 14.4 per cent Malay births and 5.8 per cent Indian births.

These percentages are quite close to the population distribution by ethnic group in 1985, which was 76.4 per cent Chinese, 14.9 per cent Malays and 6.4 per cent Indians.

If there had been 43,125 Chinese births, the total number of births in 1985 would have been 56,254. This figure is very near the estimate of 55,900 births required to match replacement fertility in 1985.

Nowadays, the Malays and the Indians are producing children at a rate very close to the two-child family level, while the Chinese are producing well below this point.

The possibility of achieving our demographic goal of stabilizing our population in the future lies with the Chinese population in Singapore.

We will next look at fertility differences among various educational groups, although this analysis is handicapped by inadequate data. Birth statistics classified by educational qualification of mothers have only been compiled recently, since mid-1983.

Also, since we lack good data classified by educational qualification for the female population in non-census years, figures for those years have had to be indirectly estimated from the annual labour force survey.

Our calculations confirm the existence of differences in fertility among educational groups. The 1985 fertility for the three educational groups was as follows:

Educational qualification	GRR
PSLE certificate and below	0.93
O Level certificate	0.58
A Level certificate and above	0.66

We must caution that these rates are crude estimates. This is because the definition of "educational qualification" differs between the birth statistics (where figures are given for those who have successfully obtained

their certificates at the three educational stages) and the labour force survey data (where figures refer to those who have merely attended the various stages and need not have obtained the relevant certificates).

A third kind of fertility difference exists among the various income groups. In general, women in the lower income group tend to produce more children than those in the higher income group.

However, it is not possible to compute the variation of GRR with income because birth statistics classified by income of mothers or fathers have never been collected in the birth registration system.

**AVERAGE NUMBER OF DAUGHTERS BORN TO
WOMEN OVER THE YEARS**

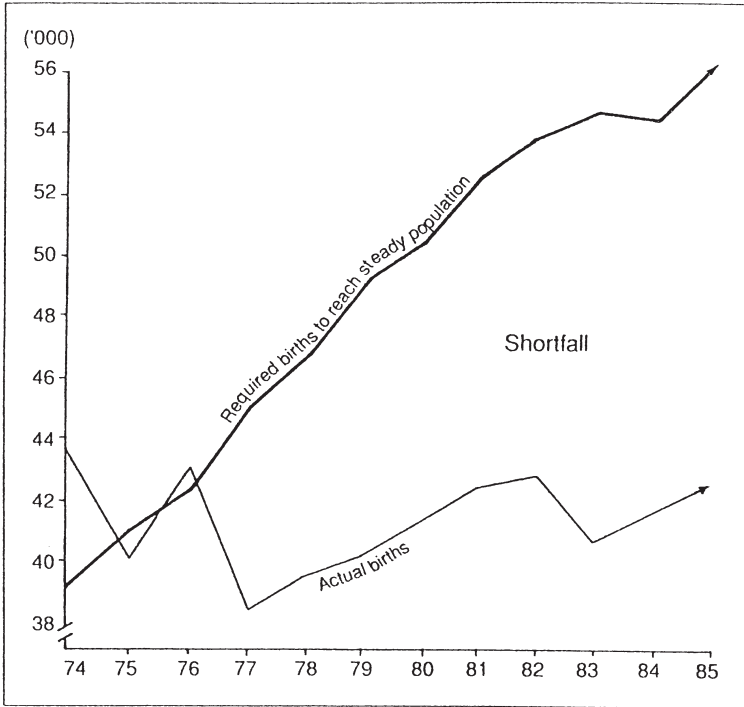
Year	No.
1970	1.505
1971	1.478
1972	1.486
1973	1.356
1974	1.135
1975	1.006
1976	1.019
1977	0.878
1978	0.869
1979	0.855
1980	0.841
1981	0.830
1982	0.816
1983	0.766
1984	0.772
1985	0.779

Figures represent gross reproduction rate

**HOW BIRTH PATTERNS DIFFER FROM THE
POPULATION DISTRIBUTION**

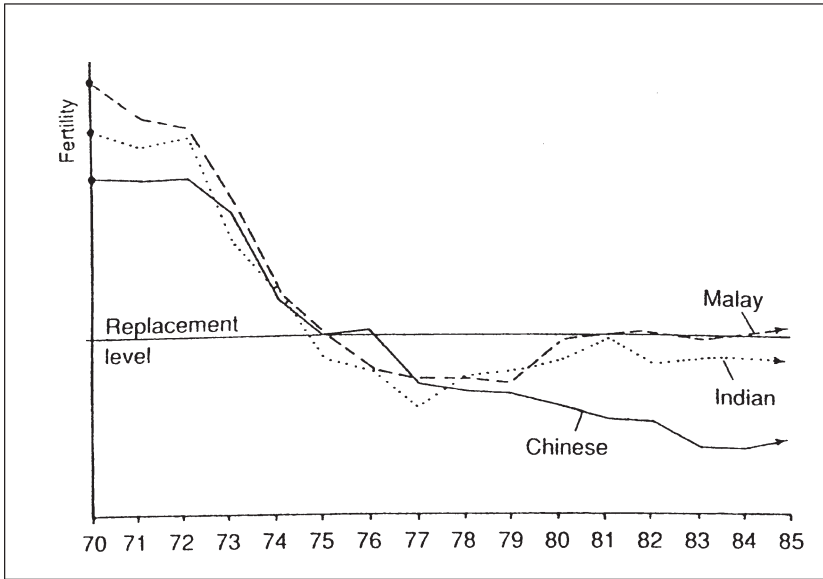
Race	Actual births in 1985		Present racial composition	Birth required for a similar balance
Chinese	29,355	69.1%	76.4%	43,125
Malays	8,104	19.1%	14.9%	8,104
Indians	3,280	7.7%	6.4%	3,280
Others	1,745	4.1%	2.3%	1,745
Total	42,484	100.0%	100.0%	56,254

APPENDIX C.1 HOW FAR OFF TARGET OUR BABY OUTPUT HAS BEEN



Years	Actual births	Required births	The birth gap	
			Gap (Absolute)	Gap (%)
1974	43,268	39,074	+ 4,194	+ 10.7%
1975	39,948	40,703	-755	-1.9%
1976	42,948	42,035	-252	-0.6%
1977	38,364	44,788	-6,424	-14.3%
1978	39,441	46,521	-7,080	-15.2%
1979	40,779	48,887	-8,108	-16.6%
1980	41,217	50,235	-9,018	-18.0%
1981	42,250	52,176	-9,926	-19.0%
1982	42,654	53,578	-10,924	-20.4%
1983	40,585	54,316	-13,731	-25.3%
1984	41,556	54,174	-12,618	-23.3%
1985	42,484	55,900	-13,416	-24.0%

**APPENDIX C.2
FERTILITY AMONG THE THREE ETHNIC GROUPS**



Year	Daughters per woman		
	Chinese	Malay	Indian
1970	1.463	1.720	1.590
1971	1.460	1.627	1.549
1972	1.462	1.599	1.575
1973	1.357	1.390	1.284
1974	1.121	1.195	1.145
1975	1.000	1.032	0.956
1976	1.042	0.912	0.905
1977	0.871	0.897	0.814
1978	0.859	0.896	0.899
1979	0.846	0.886	0.902
1980	0.801	0.983	0.948
1981	0.779	1.008	0.984
1982	0.762	1.023	0.930
1983	0.698	0.989	0.948
1984	0.694	1.016	0.944
1985	0.702	1.034	0.939

Figures represent the gross reproduction rate.