

# Fertility Rate

In our modern society it is most essential that fertility rate should not only be checked but be most appropriately assessed so that administrators and planners become quite conscious of the magnitude of the problem. While finding out Fertility Rate, child-women ratio, general fertility rate, total fertility rate, gross production rate, cumulative rate etc. are taken into consideration.

## Need for Fertility Rate

Fertility rate of a nation has all along been a matter of interest for the demographers all over the world. It is however, unfortunate that whereas the people in the past studied animal, bird populations, events leading to wars, peace, marriages among the elite of the society etc., they failed to pay due attention to this important aspect of human life, which so vitally influenced and effected both administrators and planners. It was primarily because in the past growth of human population did not very much strain economic resources of the nations on the one hand and administration and administrators on the other. But as the time passed and problem of population growth became serious, it was realised that whole issue should be seriously studied. It was realised that unless nation knew of the birth rate, it could not fully plan its needs and requirements and might be taken unawares. At any time information about fertility rate can help in finding out child-women ratio, the ratio of male and female born in a particular year etc. Usually, while finding out fertility rate, figures registered with the authorities responsible for registering birth of children are depended upon but demographers also take aid and assistance of figures collected at the time of census. Some of the important methods for calculating fertility rate are as follows :

## Child-Woman Ratio

Child-woman ratio is a ratio which a population has between the women and the children. A child is considered to be a baby between the age of 1 to 5 years whereas under this only those women are covered which are under reproduction age group, which means women between the age group of 15-50. While finding out the ratio the formula usually adopted is :

$$\text{Child Women Ratio} = \frac{\text{Children of the age of less than 5 years}}{\text{Women of reproduction age group}} \times 1000$$

child wife Ratio

time passed  
problem  
gross  
pop  
that  
a pl  
about  
method  
of  
B  
R

Barclay has suggested that this ratio can conveniently be computed by the following formula :

$$\frac{Po-4}{f15-44} K$$

Where

$Po-4$  = Number of children, both sexes under 5 years of age.

$f15-44$  = Number of females between the 15-44 years age group (sometimes it is 18-49)

$K=10,000$ .

It is used to measure incidence of child bearing in the population of adult women, specifically it is the number of children under 5 years of age per 1,000 women of child bearing age. While finding out ratio, figures from census as well as registration office are taken. In fact registration figures play a very vital role in this regard because with the help of these figures it becomes easy to find out ratio without any bias. Though it is easy method of finding out ratio, yet it has its own problems. It has rather rightly been said that, "Therefore, though useful, the child-woman ratio is not very precise as an index of fertility. Its evidence is indirectly derived from this group of servitors, rather than from the number of actual births, and thus it is affected by several other factors besides fertility alone."

↓  
Regi  
n  
VH

Q-1

el  
ems  
with  
population  
take  
can  
is  
that

**Features of Birth Statistics.**

Fertility is closely related to birth. Before we actually discuss various methods of finding out fertility rates, let us briefly pause to discuss as to what are peculiar features of birth statistics. **First** such peculiarity is that whereas death of a person occurs once in life time, there can be several births to a couple. The couple can give birth to any number of children as long as it has potentiality to give birth. Then another feature is that more the children are born in a family, less shall be the affection for each child and less shall be desire of the parents to have children. Desire for children increases only when the couple finds it difficult to have children. Then another feature is that child birth is linked with couple, though in calculating age specific birth rate either male or female population is taken into account.

Mind  
①  
live

Still another characteristic is that child birth can take place only during a limited period, i.e. during the age when the couple has reproduction capacity. After that stage there can be no child birth, since there will be no fertility. Though still births are an important factor in birth statistics, yet by and large such calculations are made on the basis of children born alive.

Q-2

**Methods of finding Fertility Ratio.**

There are seven important methods of finding out fertility ratio on the basis of information available through registration. These are :

1. Crude Birth Rate (CBR)
2. General Fertility Rate (GFR)

CBR  
GFR

3. Age Specific Fertility Rate (ASFR)
4. Total Fertility Rate (TFR)
5. Gross Reproduction Rate (GRR)
6. Cumulative Fertility Rate (CFR)
7. Standardised Fertility Rate (SFR)

ASFR  
TFR  
GRR  
CFR  
SFR

**1. Crude Birth Rate.** In fertility rate, crude birth rate plays an important role. According to Barclay, "The Crude Birth Rate is a ratio of total registered live birth to the total population, also in some specific year, also multiplied by 1,000." For crude birth rate the formula applied is :

$$\text{CBR} = \frac{\text{Total number of children who took birth in a year}}{\text{Mid-year total population}} \times 1000$$

Barclay has given his formula by saying :

$$\text{CBR} = \frac{B}{P} K$$

where CBR = Crude Birth Rate.

$B$  = Total number of births registered during the calender year.

$P$  = Total population at the middle of the year.

$K$  = 1,000.

Thompson and Lewis have defined Crude Birth Rate by saying that "The crude birth rate for any specified population is obtained by dividing the number of births recorded in that population during a specified year by its total numbers, which gives a fraction of birth per person ..... This rate is called crude because all differences in composition between population are ignored in calculating it."

Crude Birth Rate is just opposed to Refined Birth Rate. The later has been defined as the difference between population wherein a certain characteristics have been taken into account in making refinement. For quite sometimes in the USA crude rate was distinguished from a corrected birth rate by increasing the number of births to allow for the fact that not all births are recorded.

It is easy to find crude rate because figures which are needed for finding out it are easily available and these are also extensively used. Crude birth rate however, has its own limitations. According to Thompson and Lewis, "However, the crude birth rate carries no implication as to why the birth rates are different in different years and between different population at the same date." Then another limitation is that it is not safe to find out fertility rate on the basis of whole population because whole population in no country can always be fertile. There can be no fertility among the children and the

RE  $\frac{P}{M} \times K$   
 ↓ total mother of all ages.  
 ↓ constant - 1000

FERTILITY RATE

aged. Accordingly in finding out fertility rationally such population should be taken into consideration which is in the reproduction age group.

Then another fact which ought to be taken into consideration is that reproduction activity is related to women and as such only such population and not the whole population should be the basis for calculation.

This rate can only be true and effective when the ratio between total population in the reproductive age group is stable, but such a ratio is always changing. (CGR)

Female Population → 2. **General Fertility Rate.** After crude birth rate comes general fertility rate. This rate is the number of birth per 1,000 women of these ages and uses the number of women of child bearing age in a population as a base for the calculation of a birth rate rather than the total population. It is an improvement over crude birth rate because in it only population of reproductive age group is taken into consideration. Not only this, but general fertility rate does not take whole population of the country into consideration but female population of reproductive age group only becomes its basis. In the words of Bogue, "The General Fertility Rate is the number of births that occur in a year per 1,000 women of child bearing age". Thompson and Lewis have said that "General Fertility Rate denotes the number of births per thousand women of child bearing age." Benjamin has said that, "General Fertility Rate is obtained by expressing the live births as a rate per thousand of women of child bearing age taken as either 15-44 or 15-49". Prof. Barclay is of the view that, "General Fertility Rate or General Fertility Ratio is a ratio of total yearly registered births to the population of woman of child bearing age. The purpose is to restrict the denominator of the rate to potential mothers by excluding all men and large groups of women not exposed to the risk of child bearing by reason of age." Such a rate could be found out with the help of following formula :

$$GFR = \frac{\text{Total number of live births in a year}}{\text{Mid-year population of the women in reproduction age group}} \times 1000$$

... This is also calculated with the help of following formula :

$$GFR = \frac{B}{P_{15-49}} \times K$$

B = Represents the total registered live births in year.

P<sub>15-49</sub> = Represents the mid-year female population in the age group 15 to 49 years in that year.

K = Represents constant, i.e. 1000.

This becomes easy to understand with the help of following table :

Age group (1)	No. of women in '000 (2)	No. of Births (3)	Age specified Birth Rate (Col 3÷2)
15-19	40	1000	25
20-24	36	7200	200
25-29	32	8000	250
30-34	28	4200	150
35-39	24	2400	100
40-44	20	1600	80
45-49	16	1120	70
	196	25,520	875

$$\text{GFR} = \frac{B}{P_{15-49}} \times K$$

$$B = 25,520.$$

$$P_{15-49} = 196,000.$$

$$k = 1000.$$

$$\text{GFR} = \frac{25520}{196000} \times 1000 =$$

i.e. about 400 per thousand women.

While discussing the importance of this 'Thompson and Lewis have said'. "This rate is somewhat more refined than the crude rate in that addition to eliminating the influence of differences in size between population it also eliminates the effect of certain compositional differences which might exist in the populations being compared." It is with the help of this rate that it becomes possible to eliminate the influence of any differences in the proportions of males and females in the population. Again it is this rate which eliminates the effect of differences in the proportion of all women who are between the ages of 15-44 or 15-49. Thompson and Lewis are of the view that, "The general fertility rate is usually four to five times as high as the crude rate in the same population because the women of these ages normally constitute from one-fifth to one-fourth of the total population." Any significant change in the proportion of women population can take place when there are such violent events as war, spread of epidemics, fires or flood etc. Such a significant change can also come when there is rapid trend for urbanisation and the people begin to migrate from villages to cities or when due to certain peculiar circumstances people begin to migrate from one part of the country to another part of the same country or some other country. Then its other advantages is that it can be calculated in the absence of live births.

## FERTILITY RATE

This rate can give very good results when people regularly register deaths and births and enumeration of population process is very satisfactory. But when at the time of registration of birth information about age of the parents is not collected then there can be many defects in the system. In some case in this system women of the age group of 15-44 are taken into consideration, while in other cases age group 15-49 is taken into consideration with the result that the figures cannot be comparable. Then another difficulty with this system is that in it all women of age group of 15-44 are accounted for but in actual practice we know that there are widows, barren women or unmarried girls, who are not in the productive age group and as such these should be excluded. In General Fertility Rate it is usually believed that all women in fertility age group give birth to children every year, but that is not so in actual practice. There are only few women in fertility age group who give birth to children in a particular year and not all. In fact in fertility age group there are certain groups which vary in fertility e.g. age group 15-19 is likely to have different fertility as compared with the age group 19-30 or 31-44.

(ASFR)

3. Age Specific Fertility Rate. It is important basic refinement in the measurement of natality without which other refinements in many cases cannot be made. In the words of Thompson and Lewis, "Age Specific Birth Rates for any year are obtained by dividing the number of births to the mothers of each age in that year by the number of women of this age in the population at that date and multiplying this figure by 1,000. In age specific birth rate, then, is the number of births per 1,000 women of a given age per year." Under this system women of reproductive sub-age groups are divided and rate for each sub-group is separately found out. It is essential because fertility rate among men and women of different sub-age groups is always different and this must be taken into consideration while finding out fertility rate. If the rate is found out on basis of fathers, it is called paternity rate, whereas if the basis is mother it is called maternity rate.

Usually the basis of the rate is however is the mother. Prof. Barclay has given the following formula for the calculation of this rate :

$$\boxed{A.S.F.R. = \frac{bi}{pi} K} \rightarrow \text{Same age group}$$

where

$bi$  = Indicates the number of births registered during the year to women in the interval, usually such an interval being of five years.

$pi$  = Indicates the mid-year population of women in the same age group.

$K = 1,000.$

Prof. Bogue has said that "The Age Specific Fertility Rate is the number of births per year to 1,000 women of a particular age. In other words, it is general fertility age group." We can say that

$$A.S.F.R. = \frac{\text{Specified age group of women} \times 1,000}{\text{Mid-year population of women of that group}}$$

While using this method certain basic things need be remembered. In this method each child born to a mother giving reproductive age group should be taken into consideration. In the case of children whose ages are not known, it is better that their number is equally divided among all age group of women. Then it is always safe to calculate this rate on the basis of mid-year population. For this purpose usually interval is of 5 years. In the words of Thompson and Lewis, "In any event, this total fertility rate is a hypothetical rate for the women involved and would be the same as the completed fertility of those women if there were no change in any of the age specific birth rates during a generation."

**Why is this Rate Preferred?** This rate is preferred over other rates because :

- (i) In this system it is accepted that all the women in all the groups do not have the same reproductive capacity and that than changes with the age.
- (ii) It is possible to study actual cohorts of women e.g. has the reproductive capacity of women decreased or increased with the growth of age and wisdom.
- (iii) With its help it is possible to calculate Total Fertility Rate and Cumulative Fertility Rate.
- (iv) It helps in formulating policies while determining marriage age and causes about sex crimes and knowing distributional patterns of child bearing in the country.

According to Prof. Barclay, this system is good and ought to to be preferred because :

- (a) It reveals the distribution of frequencies of births among women according to age.
- (b) It helps in analysis of the fertility performance of a calendar year.
- (c) It is difficult to distort them by variation of age composition.
- (d) This rate identifies a few stages in the reproductive careers of the different age groups of women.
- (e) These rates are utilised in calculating other important measurements.

Total Fertility Rate  
Percentage of  
...

Bogue

**TFR**

**4. Total Fertility Rate.**

Bogue has defined Total Fertility Rate by saying that "It is an estimate of the number of children a cohort of 1000 women would bear if they all went through their reproductive years exposed to the age specific fertility rates in effect at a particular time." It is total or age specific birth rate and can be obtained by summing of birth rates at each age group throughout the child bearing age. This method also takes into consideration age of the father as well. This method is better than some other methods because it concerns itself only to the women who are in fertility age group and is not influenced by the age groups. Prof. Barclay has given the following formula for finding out Total Fertility Rate. It is :

$$TFR = \sum_{i=15}^{i=49} \left( \frac{b_i}{p_i} \right) K$$

- ⇒  $b_i$  = Number of live births registered during the year to mother of age (i) Where (i) is an interval of one year
- ⇒  $p_i$  is the mid-year population of women of the same age.
- ⇒ K is sometimes 1000, sometimes 1
- ⇒ S = Summation.

In actual practice  $b_i/p_i$  means the same things as was while finding out Age Specific Fertility Rate, with the only difference that in ASFR rate is found out for a gap of 5 years whereas interval in this case is only of one year of birth. In other words "The total Fertility Rate is also the same as the total number of children that would ever be born to a hypothetical group of women, if the group passed through its reproductive span of life with these birth rates at each year of age."

GRR

⇒ Important

**5. Gross Reproduction Rate.**

After Total Fertility Rate we now come to Gross Reproduction Rate. According to Thompson and Lewis "Whereas Total Fertility includes all births both male and female, the gross reproduction rate shows how many girl babies—potential future mothers—would be born to 1000 women passing through their child bearing years, if the age specific birth rates of a given year remained constant and if no women entering the child bearing period died before reaching menopause." In this all the girls are included no matter what is their year of birth with the presumption that all will enter reproductive age and will also become mothers and as well complete the whole of reproduction.

⇒ This rate can be found out by multiplying total fertility by the percentage of all births that are female births. If the product is 1000 or more, it means that 1000 or more daughters are being born by each 1000 women of child bearing age when no account is taken of the deaths of the women during their reproductive period. Table below gives the method of finding out Net Reproduction Rate.

Total Fertility Percentage of all births that few



→ Net Reproduction Rate, California, 1960\*

Age of Mother	California No of years lived in age interval by a birth cohort of 1,00,000 female	Age Specific Birth Rate	Calculated No. of Birth
15—19	484,208	102.8	49,778
20—24	482,693	267.3	129,024
25—29	480,803	189.1	90,920
30—34	478,259	103.4	49,452
35—39	474,665	48.3	22,926
40—44	469,409	13.0	6,103
45—49	461,437	0.7	323
Total	—	—	348,524

\*Authority : Population Problems by Thompson and Lewis, p. 252.

But this method of finding out rate also suffers from its own defects. It believes that both fertility as well death rates are stable and will not change. But in practice that is not so. The number of children who take birth in a decade can vary in another decade and so is the case with deaths. Both death as well as birth rate can increase as well as decrease, both on account of spread of literacy, more knowledge about bringing up of the children or on account of increased opportunities of employment for the women and so on. Death rate can be influenced on account of availability of more medical facilities nourishing food and so on. In the words of Thompson and Lewis, "The chief defect in net reproduction lies in its assumption that the age specific birth rates and death rates of a particular year will remain constant during a generation. This is very serious defect and these rates should not be used in making a prognosis of probable future growth of population."

→ **6. Cumulative Fertility Rate.** It is just like Total Fertility Rate with the only difference that this rate indicates the number of children produced by 1000 women during whole fertility period. It is found out by first finding out Age Specific Fertility Rate and then the rates are multiplied by age groups and then these are cumulated and the final result in the result of all. In the words of Thompson and Lewis, "A cumulative cohort birth rate shows the actual number of births per thousand women in a particular cohort when they have a specific age."

## FERTILITY RATE

**7. Standardised Fertility Rate.** In it differences between populations in a given characteristics e.g. demographic, social or economic are taken into consideration. Each such characteristic is believed to have same effect on natality. If we are interested in the effect of differences in age composition of two populations on their fertility, then the age distribution of the women in some population either actual or hypothetical, is chosen as a standard distribution. In the words of Thompson and Lewis, "When we are standardising for age, the question to which we are seeking an answer is: if the women in populations ABC, were distributed by age in exactly the same populations as the women in the standard population, would their natality rates bear the same relation to one another and do their crude rates or their general fertility rates or their total fertility rates. This question is answered by multiplying the age specific birth rates of each of the populations A, B, C, etc. by the number of women in age group of the standard population and summing these births for each population to secure the total number of births a standard population would have if its women had the different age specific rates of population A, B, C, etc." While calculating a standard million is fixed which implies a population of one million persons having the age composition of same population. In it women belong to different age groups are represented. Total number of births which this stand million would have in a specific year is obtained by multiplying age specific birth rates of these populations. by number of women of each age in standard population, which is then divided by one million and multiplied by one thousand to secure an age standardised birth rate per 1000 for each of the population being studied. The method of calculating Standard Birth Rate is given below.

Standard Birth Rate California and New York\*

Age of Mother	Number of females in standard million	California		New York	
		Age specific birth rate	Calculated number of births	Age specific birth rate	Calculated number of births
15—19	33,893	12.8	3,484	56.5	1,915
20—24	33,787	267.2	9,031	225.7	7,625
25—29	33,665	189.1	6,364	195.3	6,573
30—34	33,477	103.4	3,462	113.6	3,803
35—39	33,225	48.3	1,605	54.4	1,807
40—44	32,857	13.0	427	13.1	430
45—49	32,306	0.7	23	0.6	19
Total	—	—	24,396	—	22,173

\*Source: Population Problems by Thompson and Lewis; p. 254.

Standard birth rate per 1000 population

$$\frac{24396 \times 100}{100,000} = 24.4$$

$$\frac{22173 \times 1000}{100,000} = 22.2$$

⑧ **Completed Fertility Rate.** Completed fertility is a measure showing total number of live births per woman or per 1000 women, who have passed through the child bearing period. In the olden days when medical facilities were not available and there was no clear distinction between live birth and a still birth at that time actual number of live births per 1000 women of completed fertility aged 65 or over at the time of census was probably somewhat higher than the census figures.

This is based on ratio of total birth legal or illegal and total mothers of any age, below 15 years or above 50 years. At may be mentioned that there is no consideration whether the woman is separated or divorced or widowed. Similarly there is no consideration whether the child born was legal or illegal. This can be found out with the help of following formula :

$$CFR = \frac{B}{M} \times K$$

$$CFR = \frac{B}{M} \times K$$

Where

$B$  = Total Births.

$M$  = Total mothers of all ages.

$K$  = Constant, i.e. 1000.

**Cohort Fertility.** This includes all the cohort women born in a given year and follows the reproductive experience of the same women through their child bearing years, generally the years 15-49 or such of those years as they may have attained at a specified date. The minimum data needed for calculating cohort birth rates are the same as those needed to calculate the age specific birth rates. Once minimum data is collected two types of cohort birth rates can be, namely age specific cohort rates and cumulative cohort rates. Age specific cohort rates are calculated in the same manner as age specific rates but which are applied to a cohort on January 1 of a specified year. On the other hand, cumulative cohort rates are obtained by adding the appropriate age specific cohort rates upto a given point in time, i.e. until the woman of a given cohort have attained a specific age on January 1 of a specified year. This cumulative cohort rate becomes a measure of the completed fertility of a cohort when in that cohort have reached menopause at about the age of 45. Given below is an illustration of procedures for computing six basic measures of fertility, which clarify the position :

- ① age specific cohort rate. (January applied)
- ② cumulative cohort rate. → (Completed cohort)

FERTILITY RATE

Illustration of Procedures for Computing Six Basic Measures of Fertility

Age of Women	No. of Women of specified Age	No. of births to women of specified Age	Age specific Birth rates per thousand women	Standard population	Expected Birth	Cumulative Fertility Rate
1	2	3	4	5	6	7
15-19	6,588,602	586,966	89	195,327	17,429	445
20-24	6,519,937	1,426,912	258	174,139	44,928	1,735
25-29	5,537,104	1,092,816	197	153,807	30,299	2,770
30-34	6,111,422	687,722	112	139,763	15,653	3,280
35-39	6,418,536	359,908	56	125,761	7,043	3,560
40-44	5,917,805	91,563	15	111,878	1,678	3,633
45-49	5,553,943	5,182	1	198,231	98	3,640
Total	41,647,349	3,251,070	102	1,000,000	117,128	3640

\*Source and Authority : Principles of Demography by Donald J. Boguo, p. 628.

→ (1) Crude Birth Rate :

$$\frac{\text{Total Birth}}{\text{Total Population}} = \frac{42,51,070}{179,323,798} \times 1000 = 23.6$$

→ (2) General Fertility Rate :

$$\frac{\text{No. of Births}}{\text{No. of women of specified age}} \times 1000 = \frac{42,51,070}{4,1,647,349} \times 1000$$

→ (3) Age Specific Fertility :

$$\frac{\text{No. of women of specified age}}{\text{Age of women}} \times 1000 \text{ for each age.}$$

→ (4) Total Fertility Rate : Sum of ASFR  $\times$  Time Intervals  
 $= 728 \times 5 = 3640$

→ (5) Cumulative Fertility Rate = ASFR Times 5, cumulated by age : Col 6.

→ (6) Standardised General Fertility Rate = Sum of Col. 6 divided by sum of Col. 5  $\times 1000$ .

$$= \frac{117,128}{1,000,000} \times 1000 = 117$$

→ **Inter-relationship Between the Measures.** We have discussed some of the measures which are usually taken for measuring fertility. These steps are not isolated from each-other. on the other hand, these are inter-dependent and closely liked ones. In 1963 Bogue and Palmore made an attempt to find out this relationship. They collected information and studied population figures and registration figures of 50 such countries where figures available could be depended upon. They then tried to find out fertility by measure and by finding out coefficient of correlation. They also tried to find out inter-relationship of all measures. Their researches led them to the conclusion that the differences between different measures varied from 1,000 to 1982 and some of these measures almost gave equal results and thus there is close relationship between all. If in one case one rate can be found out, then it can become easy to find out other rates. While carrying out their researches they took into consideration women between the age group of 15-49 and only 50 countries where data could be depended upon were taken into consideration. The figures could vary in case more countries were covered. With the help of census data both of them also tried to find out child-women ratio. Median age at first marriage, age composition within the range 15-49 years, infant mortality rate and per cent of women marrying by ages 15 to 19, to 45 to 49.

→ In so far as fertility is concerned Lee Jay Cho studied some of the countries with high and low fertility rates and came to the following conclusions :

FERTILITY RATE

⇒ 1. In countries with low fertility rates average age of marriage is five years more, as compared with average of marriage of people of countries with high fertility rate. But postponement of marriage is responsible for lower fertility.

⇒ 2. In countries with low fertility rate, fertility is confined to women between the age of 20-29 years. About age of 40, it becomes almost nil. On the other hand, fertility is found among women of all ages in countries with high fertility rate.

⇒ 3. In countries with high fertility rate, death rate of children is very high and this can be one reason even for high fertility rate.

⇒ 4. In countries with high fertility children in age group of 1-15 constitute 44% of total population.

⇒ 5. In such countries educational standard of people is very low and masses are economically poor and backward. Most of the people are agriculturists and live in rural rather than urban areas. They cannot have nutritive food and by and large people are physically poor.

⇒ 6. It is wrong to believe that countries which are industrially advanced have low fertility e.g. England, Norway and Scotland which are industrially very advanced but cannot be called as countries with low fertility.

**Demographic Transition.** It is now fully well clear that it is possible and within human control to check fertility. If fertility is 55% in Sudan it is only 14% in Sweden. In the words of Prof. Bogue, "The progress of a nation in making the transition from high to low fertility may be measured by tracing its movement between these two extremes. In fact, by simple statistical manipulation we can construct an index showing the per cent of demographic transition that has already been completed by a population." Prof. Bogue has also given method of measuring transition from one stage to the other, which is as follows :

Stage of Transition	TFR	GFR
① Start	7500	235
② Complete	2200	60
Total change during transition	(-)5500	(-) 175
Percentage of demographic transition completed or		
$PCT-DEM-Trans-Comp = \frac{1}{2}(234 - GFR) \times \frac{7500 - TFR}{5300}$		

Countries  
education  
Standard  
low  
Economy  
Call  
poor  
and physisic  
poor.  
(224)  
B084

With the help of this equation it is possible to find out rate of transition in fertility in a nation. Prof. Bogue has tried to find out demographic transitional index of continents of the world, which according to him in Africa is 19.9%. South America 35.4%, Asia is 39.3% and USSR 80.90%. But almost every country is making every efforts to keep fertility rate as low as possible. In fact more effort at present are being made in developing rather than developed countries to check population growth rate and fertility.

**Fertility of India.** In so far as India is concerned, fertility rate has been brought low, but population has been growing because deaths have also been checked and controlled. India has fully well realised that in case her five year plans are to be implemented successfully it is essential that both population and fertility should be checked. At present in India population growth rate is 2.2% annual and if this rate is not effectively checked then by the turn of the century, India's population will touch the mark of 1100 million. During 1881-1941, birth rate of population in India remained between 45 to 53%, but between 1951-61, this rate was 41.7%. Though this rate has been worked out by our Census Department, but many well known demographers have tried to establish that birth rate during this period was between 40.4 to 48.6%. According to 1971 Census growth rate was 2.46% annual whereas birth rate decreased from 41.7 to 38.6%.

In so far as fertility is concerned, in India it is believed that it is high because India resides in villages and there it is bound to be higher as compared with the cities. Then another factor is that in India there are two major religious communities; namely the Hindus and the Muslims. In case both these religious communities do not agree to control birth rate and fertility, one religion of its own cannot control fertility and birth rate.

As regards rural-urban fertility, information has been supplied by National Sample Survey. From available figures it becomes clear that birth rate in rural India has always been high as compared with urban India. For the women of age group 15-44, GFR for urban India has been 170.1 as against rural India, where it has been 182.4. But on the basis of general marital fertility rate it has been found that in urban areas fertility was 216.5, whereas in the rural areas it was 211.3. In other words it can be said that there is not much difference between the two. If there is any difference that is not only due to age at marriage, as the people in the cities usually marry late, as compared with the people in the rural areas. National Sample Survey has showed that on account of late marriages in the urban areas, fertility rate of the age group of women of 15-19 years is much less, as compared with the rural areas. This situation however, changes when fertility of women of 20-30 years comes. In fact in urban areas maximum fertility is between the age of 20-30. Women in the urban areas do not like to go on producing children till late stage and wish to be free from their responsibility towards their children, as quickly as possible.

del  
Re  
i  
h  
bu  
Hi  
la  
2.5  
per

→ Rural-ur  
↓  
GFR  
Patti  
K

(N.S.S.)  
1880  
in city  
some  
Marriage  
very  
late.  
instead of  
rural  
Area.

1971 CENSUS

higher than Hindu.

Then another factor which is closely related to fertility in India is religion. According to 1971 census, Muslim population in India during 1961-71 increased by 30.8% whereas Hindu population during the same period increased 23.7%. In other words fertility among the Muslims is higher as compared with the Hindus. Though religion can be one important factor for this, yet the other factors could be their low literacy level, their indifferent attitude towards family planning or economically poor standard of the people. The studies have also revealed that mortality rate among the Muslims is higher, whereas among the Hindus it is much less. In a study conducted by National Sample Survey in Bombay it was established that Muslim women give birth to more children than the Hindu ones. It has also been established that fertility rate among the Hindus and the Muslims is almost the same in the rural areas but it considerably varies in urban areas where it is higher among the Muslims. In the urban areas fertility begins to decline after the age of 25 among the Hindu women, whereas this decline among the Muslim women starts after 35. On the whole fertility among the Muslims is higher by 5 to 15% as compared with the Hindus. Religion is not the only factor for this. There are some other factors responsible for this e.g.:

1. The Hindus marry at late stage as compared with the Muslims.
2. The system of widow remarriage among the Hindus is not as common as among the Muslims.
3. By and large it is presumed that in India the Hindus are more inclined towards family planning programme, as compared with the Muslims.
4. Female education among Hindu women is higher as compared with the Muslim women.
5. On the whole literacy among the Muslims is less, as compared with the Hindus with the result that more Hindu women go in for employment. Naturally employed women do not prefer to have large families. These wish to limit their family size, because there are many problems involved in their bringing up, schooling and their final settlement in life.
6. Economic standard of the Muslim, in India is comparatively lower, as compared with the Hindus and so is the case in so far as productive and remunerative employment is concerned.
7. The Hindus, as a whole, pay more attention and spend more money on the bringing up of their children, as compared with the Muslims.
8. The Hindus believe in monogamy, whereas among the Muslim there is prevalent system of polygamy. Naturally the former are likely to have less children, because each woman has limited capacity to produce children.

⇒ in muslims ⇒ polygamy

at h  
ates  
7 muslim  
high  
t in  
ndy's  
a Rates  
17.  
year

ban

al  
ity  
ste



⇒ in India high  
Fertility Rate but  
an other country

⇒ 9. The Hindu families have also less fertility because by and large the Hindus go after living standard. They have also a craze for having better learning and educational standard.

Even otherwise fertility rate in India can be higher, as compared with other countries because in India it is believed that the children can only provide old age security to their parents. There is always keen desire to have sons, rather than then daughters and for getting a son a couple can increase fertility, as well as the number of children. It is also bound to be higher, because India is an agricultural country and an agriculturist wants more hands than the people engaged in other occupations and professions, especially those engaged in services.

**Growth Rate in the World.** In spite of the fact that efforts are being made to check population growth all over the world, it is strange that population has all along, in all parts of the world been increasing. In Africa continent this rate is 2.7%, in Asia 2.3%, in North America 1.2%, in South America 2.9%, in Australia 2.2% but in Europe it is as high as 9.8%. In some of the important countries increase in birth rate, according to 1971 census, has also been quite visible. In the USA increase has been 1.1%, in Canada 1.7%, in China 1.8%, in Japan 2.5%; in Sweden and Denmark 5%; in Iraq 3.4%; in Kuwait 8.2%; in Pakistan 3.3%; in India 2.6%; in Brazil 2.5 and in Chile 2.3%. Projected population of Mexico (1970-85 by five year age groups for each sex, according to one estimate shall be as under. Fertility in this case is assumed to decline linearly by a total of 50% between 1965 and 1980.

(In Thousands)

Age	1970	1975	1980	1985
<b>Male</b>				
0-4	4,145.2	4043.9	3787.8	3955.9
5-9	—	4070.2	3989.7	3752.6
10-14	—	—	4050.3	3974.5
15-19	—	—	—	4031.7
<b>Total Males</b>	<b>24759.2</b>	<b>28106.2</b>	<b>31159.0</b>	<b>34324.7</b>
<b>Females</b>				
0-4	3980.4	3882.4	3621.2	3772.3
5-9	—	3925.5	3843.2	3596.6
12-14	—	—	3911.8	3833.2
15-19	—	—	—	3898.9
<b>Total Females</b>	<b>34538.9</b>	<b>27817.1</b>	<b>30787.5</b>	<b>33346.6</b>
<b>Grand Total</b>	<b>49298.1</b>	<b>55923.3</b>	<b>61946.5</b>	<b>68171.3</b>

Sources : Coale A.J ; Hoong E.M , Population Growth and Economic Developments in Low Income Countries. p.383. .

Modern scientific means and methods have of course helped us in checking population growth; but population has been increasing still. The people are quite conscious about the advantages which a small size family brings, but still more and more awakening will have to be created among the people of under-developed and developing countries, if world population is to be brought within desired limits. Fertility rate can be brought down both by persuasion as well as coersive methods. Since developing countries are not yet fully appreciating the need of family planning programmes and checking fertility rate, therefore, persuasion sometimes does not work. At the same time there is sharp reaction to the use of force in checking fertility. Therefore, problems in these countries is really serious and needs tactful tackling. In India experiments of checking fertility by coersive means was carried for a short while and it proved a failure. It was very much resented by the electorates. It appears that one way to solve the problem could to put certain disincentives to large family size so that the people limit their family with the temptation to get incentives which otherwise cannot become available to them.

effort to change

Crude Birth Rates =  $\frac{B}{P} \times K$

General Fertility =  $\frac{B_i}{P_i} \times K$

Age specific Fertility  $\rightarrow \frac{B_i}{P_{15-45}} \times K$