Fertility Indicators

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Definition of Fertility

- In demography, **fertility** defined as the product of reproduction and refers to live births.

- **Fecundity-** The physiological ability to bear children

- **Infertility –** absence of live born children (whether or not pregnancy has occurred)

- **Fecundability –**probability of becoming pregnant, that depends on pattern of sexual and pregnancy preventive behaviours.

Factors affecting fertility of an individual

- Age at marriage – Earlier marriage
- Duration of married life –Longer duration of married life
- Birth Interval - Shorter interval between pregnancies

Increase Fertility

- **Other factors** – Education and economic status of the family, Empowerment of women, urbanization, Child rearing practices, Socioeconomic development of a country.

Measurement of Fertility (Fertility Indicators)

- Crude Birth Rate
- General Fertility Rate
- General Marital Fertiilty Rate
- Age specific fertility rate
- Age specific marital fertility rate
- Total fertility rate
- Total marital fertility rate

Measurement of Fertility (Fertility Indicators)

- Gross reproduction rate
- Net reproduction rate
- Child woman ratio
- Pregnancy rate
- Abortion rate
- Abortion ratio

1.Crude Birth Rate (CBR)

- Simply called the Birth Rate
- Number of LB/1000 Mid Year Population (MYP) in a given area during a given year (India in 2020 – 18.2/1000MYP)

$$\text{CBR} = \frac{\text{No of Live Births}}{\text{Mid Year Population}} \times 1000$$

- Higher the CBR – Higher is the fertility

- **Disadvantage**– Denominator includes population not exposed to child bearing such as children, elderly

2.General Fertility Rate (GFR)

- Number of Live Births per 1000 women of reproductive age (15-49 years) irrespective of their marital status
- Denominator restricted to women of child bearing age – therefore a better indicator than CBR

$$\text{GFR} = \frac{\text{Number of live births}}{\text{MYP of women in child bearing age (15 -49 years)}} \times 1000$$

- India- 76.2 children born to every thousand women aged 15-49 years. (Rural -83.8 and Urban – 60.8)(2015 SRS)
- **Limitation** – Not all women in reproductive age group are exposed to risk of child birth (unmarried women)

3.General Marital Fertility Rate (GMFR)

- Here , denominator consists of only married women in the reproductive age, during the given year.

$$\text{GMFR} = \frac{\text{Number of live births}}{\text{MYP of married women in the reproductive age group}} \times 1000$$

4. Age Specific Fertility Rate (ASFR)

- The denominator consists of women in any specific age group. – hence more precise

$$ASFR = \frac{\text{Number of live births during a year at a specified age of a mother}}{\text{MYP of women in the same specified reproductive age}} \times 1000$$

Advantage: We can evaluate in which age group family welfare services need to be concentrated.

ASFRs (Age Specific Fertility Rates) by residence, India, 2015

Age Groups	Total	Rural	Urban
15-19	11.1	12.3	8.3
20-24	173.8	192.7	132.0
25-29	150.3	163.5	125.8
30-34	77.6	85.3	63.6
35-39	26.2	28.9	21.1
40-44	10.9	12.3	8.4
45-49	3.6	4.1	2.8

5. Age specific marital fertility rate (ASMFR)

- Here denominator consists of married women of the specified age.

$$\text{ASMFR} = \frac{\text{Number of live births at a specified age of married mother} \times 1000}{\text{MYP of married women in the specified age}}$$

6. Total Fertility Rate (TFR)

- The sum of all ASFR for all ages and is expressed per woman .
- The average number of children a woman would have during her reproductive age if she passes through the current fertility rate.
- Target in India – 2.1 (2.2 in 2017)

7. Total Marital Fertility Rate (TMFR)

- Sum of all ASMFR for each year
- Denominator is married women
- Average number of children a married woman would have during her reproductive age, if she passes through the current fertility rate

8. Gross Reproduction Rate (GRR)

- Average number of girls that would be born to a woman during her reproductive age if she experiences current fertility rate without dying

$$GRR = \frac{\text{Number of female live births}}{\text{Total number of live births}} \times 1000$$

GRR (In 2020) =1.1

9. Net Reproduction Rate (NRR)

- Average number of female children a newborn girl will bear during her reproductive age assuming fixed age specific fertility and mortality rates.
- The measure to the extent to which mothers produce female infants who survive to replace them
- IF NRR=1 it means female population is maintained exactly and population remains almost constant.
- If NRR <1 , it means population will decrease and if > 1 population will increase.

9. Net Reproduction Rate (NRR)

- In India **NRR=1.6 (2020)**
- **NRR of 1 can be achieved only if 60% of eligible couples practice one or the other method of family planning.**
- Based on observation that 50 to 60% of births are of birth order three or more
- Therefore attaining a 60% CPR will be equivalent to cutting off almost third or higher order of births therefore leaving 2 or less than 2 surviving children per couple.

10. Child Woman Ratio

- Number of children between 0 and 4 years per 100 women of reproductive age group during a given year .
- CWR= $\frac{\text{Number of children between 0 and 4 years}}{\text{Number of women of reproductive age}} \times 1000$

This measure of fertility is useful where birth registration is poor.

11. Pregnancy Rate

- The number of pregnancies occurring irrespective of the outcomes, such as abortions, stillbirths,or live births per 1000 married women of reproductive age group during a given year.

$$PR = \frac{\text{Number of pregnancies occurring during a year}}{\text{Number of married woman of reproductive age}} \times 1000$$

11. Pregnancy rate continued .....

- The PR is also employed to assess the failure rate of contraception. It is expressed per 100 women years. (100 x 12 =1200 months)

- **Pearl Index (failure rate of contraception)=**

$$\frac{\text{Number of pregnancies occurring in a year}}{\text{Total months of exposure}} \times 1000$$

12. Abortion Rate and Abortion Ratio

Abortion Rate : The number of abortions occurring during a given year per 1000 women of reproductive age .

Abortion Ratio: It is the ratio between the number of abortions occurring in a given year and the number of live births.

References

1. O Frank. The Demography of Fertility and Infertility.
2. AH Suryakantha. Community Medicine with Recent Advances.
3. Estimates of Fertility Indicators. SRS 2015

Thank you