Impact of Family Planning on Fertility in Jharkhand State: Based on NFHS Data

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Abstract: In the present study an attempt has been made to know the impact of family planning on fertility in Jharkhand State through the Prevalence Model. If prevalence levels of both programme and non-programme contraception are known, this technique permits the estimation of gross natural and potential fertility for assessing births averted. With the emergence of the National Family Health Survey (NFHS: 2005-06) to monitor family planning and health activities, this method becomes a useful tool. Of special, interest is the ability of the procedure to yield estimates by age group as well as by type of contraceptive methods used. In the study, the standard method-specific use-effectiveness levels weight observed use and prevalence level by method have been applied. Of the total births averted in Jharkhand State by programme contraception, 80 percent of births were averted by Sterilization users in 2005-06 while the spacing methods users contributed to about 20 per cent of the birth prevention. The spacing methods need to be strengthening for the greater use. With regard to the births averted by non-programme contraception/natural methods, the main contribution was made by the users of Rhythm of about 45 percent, which was followed by the users of Withdrawal of 43 percent and by the other methods of 13 percent. Of the total birth averted in Jharkhand State, the contribution of programme contraception and non-programme contraception/natural methods is about 85 percent and 15 percent respectively in 2005-06. The programme contraception has the dominance role to control fertility however the non-programme contraception/natural methods use should also be enhanced at the places where accessibility of programme contraception is poor.

Keywords: Births Averted, Prevalence Model, Potential Fertility Rate and Natural Fertility Rate

1. Introduction

With the rapid growth of national family planning programme in 1990 onward, family planning administrators and policy makers felt an increasing need to evaluate the fertility impact of the programme yearly. For such, probably the most widely used measure of fertility impact is the number of births averted by a programme in a given year. An estimation of the number of births averted is typically obtained by subtracting observed fertility (i.e. fertility with programme) from potential fertility (i.e. fertility without the programme) and multiplying the differences by the appropriate base of the population. Since potential fertility is an unobservable quantity, it has to be estimated indirectly. Gross and net potential fertility are two major types of potential fertility used in the study. The gross potential fertility is the fertility that would prevail if all use of programme contraception were eliminated, without switching to the non-programme contraception. The net potential fertility is the fertility that actually would be observed if there had never been a programme. In that case, many who would have been programme users would have obtained supplies from non-programme sources. This substitution would tend to make net potential fertility lower than the gross potential fertility.

The use of contraception greatly reduces the chances of conceiving, but except in the case of sterilization, the chance is not zero. To take this contraceptive failure into account, some methods introduce a penalty for accidental failure. The simplest way to do this consists of multiplying potential fertility by ‘e’, the contraceptive use-effectiveness. In the present study Prevalence Model has been used in the State of Jharkhand to evaluate the number of births averted by programme and non-programme contraception efforts.

2. Prevalence Model

The prevalence model is based on age-specific and method specific prevalence rates of both programme and non-programme contraceptives. This information helps in getting the gross potential fertility and subsequently the number of births averted by programme and non-programme contraceptive efforts. Age-specific model: The age-specific model requires information on prevalence of programme and non-programme contraception by age, age-specific fertility rates which have been taken from the NFHS data of Jharkhand State. The Census figures have been used for the female population of reproductive age. Bongaarts, J (1993) provides new estimates of gross and net impact on fertility reductions from family planning (FP) programs for 31 developing countries in Africa, Latin America, and Asia. A comparison is made of net and gross measures, and the interaction with the level of development is identified. The conclusion is reached that FP has been crucial in reducing fertility in many countries. Without FP, the total annual number of births in the late 1980s would have been 164 million instead of 120 million. There is no agreed upon measure for determining the impact of FP on fertility and estimates has ranged from 3-40%. Discrepancies in results are due to the use of multiple methodologies, of which some are unsuitable or unreliable for normal evaluation due to difference research objectives and due to conceptual differences in measurement of gross versus net impact. Gross impact refers to the reduction due to the use of contraception available from program sources. Net impact measures the reduction achieved by the presence of the program. Net and gross impact varies within each country, with net impact the smaller of the two. Gross impact usually
was measured with statistics on acceptors. The measures of
gross potential fertility, gross natural fertility and births
averted are obtained as follows;
\[ \text{NAF}_a = \frac{\text{AF}_a}{[1 - C_a(u_a + u_a^\prime)]} \]
\[ \text{PAF}_a = \frac{\text{AF}_a}{[1 - C_a(u_a^\prime) + u_a^\prime]} \]
\[ \text{BA}_a = (\text{PAF}_a - \text{AF}_a) \text{POP}_a \]
\[ \text{BAN}_a = (\text{NAF}_a - \text{PAF}_a) \text{POP}_a \]

Where;
\( a = \text{age group of women, } a = 15-19, \ldots \)
\( u_a^\prime = \text{prevalence of programme contraception, by age} \)
\( u_a^\prime = \text{prevalence of non-programme contraception, by age} \)
\( \text{AF}_a = \text{age-specific fertility rate} \)
\( \text{PAF}_a = \text{potential age-specific fertility rate} \)
\( \text{NAF}_a = \text{natural age-specific fertility rate} \)
\( \text{BA}_a = \text{birth averted by programme contraception, by age} \)
\( \text{BAN}_a = \text{birth averted by non-programme contraception, by age} \)
\( \text{POP}_a = \text{number of women in age group a} \)
\( C_a = \text{elasticity coefficient by age} \)

In order to estimate the gross potential fertility and natural
fertility, information on elasticity coefficient of sterility and
use-effectiveness by age of women is utilized.
\( C(15 - 19) = 0.620 \)
\( C(20 - 24) = 0.620 \)
\( C(25 - 29) = 0.823 \)
\( C(30 - 34) = 0.940 \)
\( C(35 - 39) = 1.022 \)
\( C(40 - 44) = 1.309 \)
\( C(45 - 49) = 1.898 \)

The method-specific model: It drives the number of births
averted by each programme and non-programme method
through the data on prevalence and use-effectiveness of
contraception for both sectors. Estimates of births averted
are obtained by the following equations:
\[ \text{BA}_m = \text{BA}. u_m . e_m / ( u' . e' ) \]
\[ \text{BAN}_m = \text{BAN}. u_m . e_m / ( u' . e_m^\prime ) \]
\( u_m = \text{prevalence of programme method 'm'} \)
\( u_m^\prime = \text{prevalence of non-programme method 'm'} \)
\( e_m = \text{use-effectiveness of programme method 'm'} \)
\( e_m^\prime = \text{use-effectiveness of non-programme method 'm'} \)
\( u' = \sum u_m \)
\( e' = \sum u_m . e_m / u' \)
\( e_m^\prime = \sum u_m . e_m^\prime / u' \)

3. Data Estimates

National Family Health Survey (NFHS-3) is the third in the
NFHS series of surveys in 2005-06. The first NFHS was
conducted in 1992-93, and the second (NFHS-2) was
conducted in 1998-99. All three NFHS surveys were
conducted under the stewardship of the Ministry of Health
and Family Welfare (MoHFW), Government of India, New
Delhi.

In Jharkhand, NFHS-3 was based on a sample of 2,483
households that is representative at the State level and
within the State at the urban and rural levels. Women age
15-49 were eligible for interview in all NFHS-3 sample
households, while men age 15-54 were eligible for interview
in a subsample of households. NFHS-3 interviewed 2,983
women age 15-49 and 996 men age 15-54 in Jharkhand
State to obtain information on population, health, and
nutrition.

The data of the National Family Health Survey (NFHS) in
Jharkhand State during 2005-06 were utilized to estimate the
number of births averted by programme and non-programme
sources separately. The prevalence information by age and
method was obtained for currently married females who are
currently using and contraceptive method. The female
population of reproductive ages 15-49 years was estimated
from the 2001 population census figures.

The data problem arose when programme and non-
programme methods were to be sorted out. Some of the
programme methods and contraceptive services, such as
condoms and pills, are available outside the programme at
the private clinic. However, the data of such services are not
available. It was thus assumed that all modern methods were
offered by the programme and were termed programme
methods. All traditional methods were considered non-
programme methods. This assumption is fairly reasonable
because modern contraceptives, such as condoms and pills,
are widely distributed through the programme.

4. Results

The application of the pertinent formulae yielded the
estimates of gross natural fertility and gross potential
fertility of Jharkhand State (Table 1). The difference
between gross potential and gross natural fertility, on the one
hand, and observed fertility, on the other hand, provided the
basis for estimating births averted by programme and non-
programme contraception for the State (Table 2). The results
show that young fertile women avert the majority of births
by non-programme methods compared to the programme
methods. The births averted by programme contraception are
concentrated among women aged 20-29 years in the State.
The findings confirm an earlier study where mean age of use
was found to be high in the early thirties (Kumar, D; 1990).
It is noted that, in general, the effectiveness or impact of the
program resembles a bell-shaped curve, i.e., in the initial
phases pregnancy reduction increased to reach a plateau and
then declined in the remaining phases. This may represent a
cyclical occurrence and pregnancy reduction may again increase.
Continual follow-up is necessary for an extended
time period to analyze any additional trends in fertility
reduction.

5. Summary

The results presented in Table 3 summarize the outcome of
the study. The silent feature of the study is that it is not
based on the service statistics and most of the data are
obtained from the State level survey. In the study, the
standard method-specific use-effectiveness levels weight
observed use and prevalence level by method. Of the 179076
births averted in Jharkhand State by programme
contraception 143598 (80.2 percent) births were averted by
sterilization users in 2005-06 while the spacing methods users contributed to only 19.8 per cent of the birth prevention. The spacing methods need to be strengthened for the greater use. With regard to the 31015 births averted by programme contraception, the main contribution was made by the users of Rhythm (44.7 percent) that was followed by the users of Withdrawal (42.6 percent) and by the other methods (12.8 percent). Of the total birth averted in Jharkhand State, the contribution of programme contraception and non-programme contraception is about 85 percent and 15 percent in 2005-06. The programme contraception has the dominance role to control fertility however the non-programme contraception use should also be enhanced at the places where accessibility of programme contraception is poor.

Table 1: Prevalence of Programme and non-programme contraception, observed fertility rates and estimated natural and gross fertility rates by age-group in Jharkhand State, 2005-06

<table>
<thead>
<tr>
<th>Age group</th>
<th>Prevalence of Programme contraception</th>
<th>Observed fertility, 2005</th>
<th>Elasticity coefficient</th>
<th>Natural fertility rate</th>
<th>Gross potential fertility rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>u'p</td>
<td>u&quot;p</td>
<td>AFp</td>
<td>Cp</td>
<td>1 – Cp(u'p+u&quot;p)</td>
</tr>
<tr>
<td>15-19</td>
<td>4.3</td>
<td>2.4</td>
<td>53.7</td>
<td>0.62</td>
<td>0.95846</td>
</tr>
<tr>
<td>20-24</td>
<td>17.4</td>
<td>3.6</td>
<td>249.3</td>
<td>0.62</td>
<td>0.86989</td>
</tr>
<tr>
<td>25-29</td>
<td>31.8</td>
<td>6.0</td>
<td>181.2</td>
<td>0.82</td>
<td>0.688906</td>
</tr>
<tr>
<td>30-34</td>
<td>19.1</td>
<td>6.2</td>
<td>176.6</td>
<td>0.94</td>
<td>0.79602</td>
</tr>
<tr>
<td>35-39</td>
<td>24.8</td>
<td>3.4</td>
<td>53.2</td>
<td>1.02</td>
<td>0.711796</td>
</tr>
<tr>
<td>40-44</td>
<td>22.9</td>
<td>1.1</td>
<td>35.2</td>
<td>1.30</td>
<td>0.68584</td>
</tr>
<tr>
<td>45-49</td>
<td>20.9</td>
<td>3.3</td>
<td>18.9</td>
<td>1.89</td>
<td>0.540684</td>
</tr>
</tbody>
</table>

Table 2: Gross fertility and gross birth averted by the programme and non-programme contraception by age group in Jharkhand State, 2005-06

<table>
<thead>
<tr>
<th>Age group</th>
<th>Female Population, 2006</th>
<th>Gross fertility effect of: Programme contraception</th>
<th>Non-programme contraception</th>
<th>Birth averted by Programme methods</th>
<th>Non-programme methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>POPa</td>
<td>PAFa – AFa</td>
<td>NAFa – PAFa</td>
<td>BAa</td>
</tr>
<tr>
<td>15-19</td>
<td>158600</td>
<td>0.00149</td>
<td>0.00083</td>
<td>2369 (1.3%)</td>
<td>1322 (4.3%)</td>
</tr>
<tr>
<td>20-24</td>
<td>123800</td>
<td>0.03092</td>
<td>0.00640</td>
<td>38279 (21.4)</td>
<td>7920 (25.5)</td>
</tr>
<tr>
<td>25-29</td>
<td>105500</td>
<td>0.06884</td>
<td>0.01299</td>
<td>72624 (40.6%)</td>
<td>13703 (44.2%)</td>
</tr>
<tr>
<td>30-34</td>
<td>997000</td>
<td>0.02630</td>
<td>0.00358</td>
<td>26220 (14.6%)</td>
<td>359 (11.5%)</td>
</tr>
<tr>
<td>35-39</td>
<td>929000</td>
<td>0.01894</td>
<td>0.00260</td>
<td>17598 (9.8%)</td>
<td>2413 (7.8%)</td>
</tr>
<tr>
<td>40-44</td>
<td>818000</td>
<td>0.01538</td>
<td>0.00074</td>
<td>125855 (7.0%)</td>
<td>605 (1.9%)</td>
</tr>
<tr>
<td>45-49</td>
<td>678000</td>
<td>0.01387</td>
<td>0.00219</td>
<td>9401 (5.2%)</td>
<td>1484 (4.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>7301000</td>
<td>0.01706</td>
<td>0.00260</td>
<td>179076 (100.0%)</td>
<td>31015 (100.0%)</td>
</tr>
</tbody>
</table>

Table 3: Estimated birth averted by programme and non-programme contraception in Jharkhand State, 2005-06

<table>
<thead>
<tr>
<th>Methods</th>
<th>Prevalence of</th>
<th>Use effectiveness of</th>
<th>Estimated birth averted by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Programme contraception</td>
<td>Non-programme contraception</td>
<td>Programme contraception</td>
</tr>
<tr>
<td></td>
<td>u'p</td>
<td>u&quot;p</td>
<td>e'p</td>
</tr>
<tr>
<td>Oral pills</td>
<td>3.8</td>
<td>0.9</td>
<td>20635 (11.5%)</td>
</tr>
<tr>
<td>IUD</td>
<td>0.6</td>
<td>0.95</td>
<td>3439 (1.9%)</td>
</tr>
<tr>
<td>Condom</td>
<td>2.7</td>
<td>0.7</td>
<td>11403 (6.4%)</td>
</tr>
<tr>
<td>Tubectomy</td>
<td>23.4</td>
<td>1.0</td>
<td>141185 (78.8%)</td>
</tr>
<tr>
<td>Vasectomy</td>
<td>0.4</td>
<td>1.0</td>
<td>2413 (1.1%)</td>
</tr>
<tr>
<td>Rhythm</td>
<td>2.1</td>
<td>0.5</td>
<td>13858 (44.7%)</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>2</td>
<td>0.5</td>
<td>13198 (42.6%)</td>
</tr>
<tr>
<td>Other methods</td>
<td>0.6</td>
<td>0.5</td>
<td>3959 (12.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>30.9</td>
<td>4.7</td>
<td>179076 (100.0%)</td>
</tr>
</tbody>
</table>

References


