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A Quantitative Analysis of the Goals of
Pakistan's Family Planning Scheme.

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Introduction:

This paper is a simple exercise in logic and arithmatic.
We analyze the stated goals of Pakistan's recently- launched family
planning Scheme with respect to their internal consistency and also
their feasibility . Our parameters ( pregnancy rates, IUD insertion
rate, etc) are drawn from the Scheme itself and supporting documents.
Some of these assumed  parameters are themselves open to question
but that is not the purpose of the present paper.

Our conclusion is  that in general, the Scheme is quite
consistent internally and that its long-run goals are plausible.
We also conclude that the indexes by which "success" of the Scheme
will be measured need refinement and sharpening up. We  also
suggest that planned supplies of conventional contraceptives may not
be adequate to do the job required of them.

## Birth to be Prevented

The scheme calls for a reduction of the birth rate by
20% by 1970 (from an estimated 50 per thousand to 40 per thousand).
The Scheme boldly proposes to cover all the estimated 20 million
fertile couple in the country (excluding Tribal Areas, Kalat and
Quetta Divisions and Chittagong Hill Tracts) by 1970.

The magnitude of the targets set can be indicated most
easily in terms of births to be prevented. This can be done using
data shown in the Scheme itself and in supporting official and
semi-official documents.

Births in 1965 - 66 were about 5,5000,000 (population of
110 millions and crude birth rate of 50 per thousand). Projecting
a constant birth rate and a growth rate of 3 per cent per annum we
arrive at the following estimates of births 1965-66 to 1969-70
without family planning:

|  | Expected births in absence of Family Planning | Births to be prevented | Percent of births prevented |
|---|---|---|---|
| 1965-66 | 5,500,000 | 660,000 | 12 |
| 1966-67 | 5,650,000 | 848,000 | 15 |
| 1967-68 | 5,850,000 | 995,000 | 17 |
| 1968-69 | 6,050,000 | 1,089,000 | 18 |
| 1969-70 | 6,250,000 | 1,250,000 | 20 |

We also show above what might be described as a realistic "path" toward the goal of 20 percent birth rate reduction by annual stages, 1965-66 to 1969-70. [1]/ The Scheme indicates no such annual

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1/ Actually the birth rate will fall by more than 20 percent if total births fell by 20 percent since the other half of the fraction, total population, will continue to grow annually albeit more slowly than before. These figures of expected births are well below those of Brackett and Akers (9,p.13) because they assume a higher intitial birth rate and also a larger base population in 1964-65 than we do. (See Appendix A).

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birth targets. The monthly reports, however indicate that 10% of the females must be "covered" in the first year moving to 25% by the fifth year. We are interpreting this to also mean that 10/25 of the birth reduction will be accomplished in the first year,)

Role of IUD's

The Scheme indicates the following schedule for IUD insertions:

|         |         |
|---------|---------|
| 1965-66 | 500,000 |
| 1966-67 | 600,000 |
| 1967-68 | 640,000 |
| 1968-69 | 680,000 |
| 1969-70 | 600,000 |

According to the Family Planning Commissioner (4,p.5) the insertion of 100 IUD's prevents 27.4 births annually. This can also be understood to be an effectiveness rate per 100 woman - years of use. The 27.4 is simply the difference between expected

fertility rate with no contraception (33. per 100 woman-years)[2]
and the rate per 100 IUD's inserted. Thus, it requires just over
3 IUD's being put in place to prevent a birth. This compares to
the figure of 5 used on Taiwan. (1,p.9). Estimates of the
retention rate for the first five years after insertion have also
been presented by the Commissioner in the same paper ( 4 ,p . 5).
These are as follows:

> After 1st year 75%
> After 2nd year 50%
> After 3rd year 45%
> After 4th year 20%
> After 5th year 10%

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[2] This figure of 33. per 100 is slightly inconsistent
with a crude birth rate of 50. Thus , about 50 percent
of the Population are females about 5 percent of the
of females (or 18 percent of the entire population) are
married and in the child bearing ages, if , on the
average, one in three of these females produces a child
in any given year, the crude birth rate will be
6 per 100, or 60 per 1,000.

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Combining the above parameters (projected insertions,
retention rates, effectiveness rates) it is simple to calculate
the number of conceptions-resulting-in-live-births to be prevented
by IUD's.        These figures are shown as follows:

> 1965-66        68,350
> 1966-67        176,466
> 1967-68        265,418
> 1968-69        336,561
> 1969-70        357,418

Conceptions-resulting-in-births prevented is, of course, the same thing as births prevented. However, there is a problem in relating IUD insertions to births - prevented in terms of calender years. Thus if 100 IUDs are in place for one year the 100 woman-years of protection would prevent, according to our analysis, 33 births. However, it would not prevent 33 births in the same year. That is, 33 conceptions resulting in live births have been prevented but the births themselves would have spread out from the 9th month of the present year to the 9th month of the next year. With full information about the month-by-month insertion schedule and also the month-by-month loss rate we could calculate more precisely conceptions-prevented by months and then births prevented nine months later. However, we lack such detailed information and can instead only deal in terms of averages.

Assuming annual insertions are made evenly during the 12 months (that is, annual insertions of 600,000 equals monthly insertions of 50,000), we assume simply that the total births (conceptions-resulting-in-live-birth) also occur evenly over a 12 month period nine months after the 12 months of insertion.(There are other problems involved also and these are discussed in Appendix B.). This results in the following distribution over time of actual births prevented by the IUDs:

| | |
|---|---|
| 1965-66 | 6,800 |
| 1966-67 | 100,750 |
| 1967-68 | 205,550 |
| 1968-69 | 276,036 |
| 1969-70 | 344,854 |

Thus the total births actually prevented during the plan period is about 933, 990, about 80 percent of the total conceptions-resulting-in-live-births prevented during the same period. The remaining births prevented would have occurred after 1969-70 in any case.

These results are, at first glance, starting. It must be stressed however that the fact that births actually prevented in 1965-66 are so low is not in any an adverse judgement on the efficiency of the Scheme. The analysis, in other words, has not revealed any problems about the Scheme only a problem about the use of annual births rates as the quantitative targets of the Scheme.

Role of Conventionals:

From these estimates we can also derive a measure of
the degree of coverage and effectiveness the Scheme's targets
imply for its conventional contraceptive programmes. Thus, the
following births-to-be prevented remain after the IUD programme
(there is also a vascetomy and tube-ligation programme but the
targets are so small as to warrant ignoring them for this exercise):

| | |
|---|---|
| 1965-66 | 653,200 |
| 1966-67 | 747,250 |
| 1967-68 | 789,450 |
| 1968-69 | 812,964 |
| 1969-70 | 905,146 |

In the long-run the scheme suggests that it will cover
all the estimated 20 million fertile couples by 1970. It then
suggests a "25 percent effectiveness on the whole"(2,p.4) and this
has been commonly interpreted to mean that 25 percent of the
20 million would be continuing contraceptive users by 1970.
Allowing for the scheduled IUD insertions and using the previously-
stated depletion rates for IUD's, by 1970 there will be about 1.5
million IUD's in place. Thus, about 3.5 million women will be
using conventionals. Now, the effectiveness of conventionals
varies widely. That is, the pregnancy rate of females in
populations using condoms, foam tablets, or jelly varies from
10 to 30 per 100 woman - years of exposure. (10,8,p.63). If we
assume that these 3.5 million females practice contraception with
maximum effectiveness their pregnancy rate may be as low as 10
per 100. This means an effectiveness rate of about 25 per 100
(33 minus 10) or that 4 females practicing for one year prevent one
birth. The 3.5 million females thus prevent 875,000 conceptions annually
in the aggregate. This is, in fact, slightly more than the total
births required to be prevented by the conventionals which we
previously derived - (905,146).

Unfortunately, the same problem of timing exists with respect to the relationship of couple-years-of-protection offered by conventionals, conceptions-resulting-in-live-births prevented and the actual births prevented. That is, to accomplish a given number of births prevented in any calender year, the principle contraceptive effort must have been made in the previous years. Looked at in this light, the births-prevented the Scheme seems to call for in 1965-66 due to conventions seem out of all possible reach. The same is probably true of 1966-67 as well.

The long-run targets of Scheme with respect to births to be prevented and couples to be covered are thus logically consistent, if one thinks in terms of conceptions prevented annually rather than births.

However there are following practical difficulties:-

1) The pregnancy rate among users of conventionals is very likely too **low.** That is, the Scheme implicitly assumes that couples in Pakistan will be able to use condoms and/or foam tablets with very high effectiveness, with effectiveness in fact as high as that reached by highly-litrate urban populations in the West.

2) More fundamentally, the notion that a certain particular number of couples will be converted to family planning and that these couples are then responsible for the reduction in births is doubtful. This assumes that couples can readily and with no doubt be divided into users and non-users, (that is a "yes-no" situation,) and that the Scheme is only concerned with users. For IUD clients this is true; a woman is a user or she is not. For users of conventionals this is, however, not the case. For couples using condoms and foam tablets there exists a spectrum with "no use" at one extreme and "consistent, highly efficient use" at the other. What the Scheme presumably aims at doing is moving as many couples as possible across the spectrum to "consistent, highly-efficient use" but it cannot be assumed that a tentative committment to family planning by a couple (repeated purchases of contraceptives, for example) means they have therefore at once reached this upper limit. .

Thus, we conclude that to plan to prevent over 900,000 births annually by 1970 by covering only 3.5 million couples with conventionals is not realistic.

Taking another approach the Scheme's "25 percent
effectiveness" figure could mean a reduction of 25 percent in
the pre-contraceptive fertility rate (33. per 100) this means
an effectiveness rate of about 8. per hundred, or a pregnancy
rate with contraceptives of 25 per 100. This means about 12
females must practice conventional contraception for a year to
prevent one birth. This rate is below the best experience in
the U.S. and other developed nations but not for out of line
with other developing countries experience (5,p.357; 10). We
can next compute the number of couple years required at this
effectiveness rate to get the required reduction in births due
to conventionals:

| | |
|---|---|
| 1965-66 | 6,264,000 |
| 1966-67 | 7,056,000 |
| 1967-68 | 7,740,000 |
| 1968-69 | 7,908,000 |
| 1969-70 | 9,720,000 |

In others, by the end of the period the scheme must
induce about 10 million fertile couples to use conventional
contraceptive methods. This total is, in fact, a very reasonable
target population. As Berelson (3, p.5) and others have pointed
out the "target" is never the entire fertile population; some
are currently pregnant; some are relatively recently married, low
parity couples who desire one or more additional preganancies.
(In fact, in the training literature, the scheme urges its field
workers to view the high parity couples as their real "target"
since other studies have shown these women to have the greatest
desire for reducing future births). Thus, the 20 million total
fertile married females will include several million currently
pregnant (even allowing for the reduction of the pregnancy rate
by 25 percent from current levels), other women who are either
already practicing contraception (including IUD wearers) or are
permanently infertile, and another several million women who have
had less than three children and desire an additional pregnancy.

Of these two possible interpretations of the projected "25 percent effectiveness rate" of the scheme, we prefer the second: a 25 per cent reduction in the no-contraception pregnancy rate for the females using conventional methods. The alternate interpretation, that a total of only 25 per cent of the females will be practicing contraception in some form by 1970, implies efficiency in use for the conventionals equal to, and greater than the best experience found in any Western populations and this does not seem untenable.

## SUMMARY

Apparently the Scheme aims at inserting on the average over 600,000 IUD's a year and reaching some ten million couples with conventionals by the end at the period. In the first year of the scheme 500,000 IUD's will be inserted, preventing only 7,000 births. As the Scheme progresses, IUD's come to play an increasing role so that by the 5th year 1.7 million IUD's will be in place, resulting in the prevention of over 350,000 births or some 30 per cent of the total fertility decline called for in the Scheme. By the 5th year conventionals will be covering some 10 million couples preventing 900,000 births or 70 of the total fertility decline.[3]

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[3] Brackett and Akers (9,p.59) assume 25% of the fertile females as practicing contraception by the target data and apparently assume the much sharper reduction in the pregnancy rate among the conventionally contracepting females which we examined and rejected. (See Appendix A).

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## Quantitative Measures for Evaluation.

The preceding line of though also has some bearing on the problem of evaluating the success of the family planning Scheme in operation.

The monthly "Reports on the working of Pakistan's Family Planning Programme" are couched in terms of "couple years of protection" provided by IUD's and conventionals distributed during the month. This, in turn, is then related to the coverage" goals of the Scheme - protection for 10 per cent in the first year, 19 per cent in the second, 21 per cent in the third, 23 per cent in the fourth, 25 per cent in the fifth. (13) In point of fact, the authorities do not know how many couples" consumed" the

contraceptices distributed in any month. The monthly report
assumes 100 condoms provide one good protection for one couple.
But, if we relate the "protection" afforded by 100 condoms to
more than one couple protection extended decreases sharply.
Supplies distributed can be translated into terms of protection
extended only if we know the number of couples involved.

Similarly, couples covered can be translated into terms
of births prevented only after we know the efficiency of the
couples in their contraceptive practice, only after we know the
effect on the pregnancy rate of the females involved, in other
words. (To repeat, these problems do not arise in connection with
the clinical methods. For IUD insertions and operations there is
only the need, perhaps on a sample basis, to verify the accuracy
of the clinical records and to follow-up IUD cases to do determine
the removal and expulsion rate over time).

Thus a realistic evaluation of the probable impact on the
fertility rate of conventionals would be as follows:-

1)    Determine the amount of potential "protection" extended
in a given time period (number of inter-course occasions for
which condoms foam tablets, etc., would be adequate).

2)    Determine from local supply agents, motivators and others
(even if only on a rough sample basis) the number of couples
"consuming" these supplies.

3)    Calculate number of intercourse occasions for which
potential protection was extended per couple.

4)    Assume that per couple "consumption" of 100 "protection"-
units" (one condom, one foam tablet, etc.) means a pregnancy
rate of 10 per 100 woman years, and that there is a proportional
relationship between "consumption" of protection-units and the
pregnancy rate. (That is, per couple "consumption" of 50 "units"
means a pregnancy rate of 22 per 100; "consumption" of 25 "units"
means a pregnancy rate of 28; etc.).

5)    Calculate number of conceptions prevented as difference
between pre-contraceptive pregnancy rate (33 per 100) and pregnancy
rate arrived as above times number of females involved.

6)    Conceptions prevented can then be distributed as births
prevented in the period nine-months following the original time
period.(Appendix B presents an illustration using IUD data  but
the same methodology precisely applies for conventionals.)

## Others Fertility measures

The goal of a **reduction** of 20 per cent in the birth rate can also be expressed in terms of other fertility measures. Tietze (10, p.35) has suggested the following model:

| Pregnancy rate per 100 women-years of exposure | Births per women of completed fertility | Stable Birth rate per 1,000 population |
|---|---|---|
| 80 | 7.20 | 50.7 |
| 40 | 5.28 | 39.4 |
| 32 | 4.78 | 36.0 |
| 24 | 4.23 | 32.1 |
| 16 | 3.63 | 27.2 |

The underlying concept in column 1 differs from the years of woman-use employed in our text. The 80 shows here corresponds roughly to 50 per 100 woman years and allowing for foetal loss an annual pregnancy rate of about 35 per 100 women, very close to the 33 suggested as a parameter by the scheme. (For a full discussion of these matters see Tietze (10, pp.31-33). The figure for completed size of family is also close to those estimated for Pakistan (11, p.123) as is the stable birth rate. Thus, Tietze's model seems relevant for our purpose. And the above figure suggest that completed size of family will fall by over 26 percent if the desired targets are achieved. [4]

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[4] Brackett and Akers reach the conclusion that a drop of 28 percent is implied by the Scheme in completed fertility but their pre-Scheme figure (9.8) is much **higher** than ours, and higher than any estimates ever reached for Pakistan. (See Appendix.A.)

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## Adequacy of Supplies

It is also perhaps not without interest to check the adequacy of the supplies called for in the Scheme against the actual requirements given the previous calculations about births

to be prevented and couples to be covered by the various methods.
The following shows the total schedule 1965-70 supplies:

| | Total Quantities Scheduled in Scheme |
|---|---|
| IUD's | 3,930,000 |
| Condoms | 603,936,000 |
| Foam Tablets | 1,235,520,000 |
| Dura Foam (bottles) | 3,467,000 |
| Jelly (Tubes) | 384,000 |
| EMKO (Cans) | 305,000 |

In the case of the IUD's the total number to be inserted is only a little over 3 million and the Scheme schedules supplies of nearly 4 million, giving an apparently adequate excess for loss, wastage, defectives, and pipeline stocks.

The conventionals can be expressed in terms of coverage extended. That is, we assume one condom protecting against conception during one inter course occasion for one fertile couple. So also in the case of Foam Tablets (that is, one tablet protects against pregnancy during one inter course), while for the other the following convention factors were used :-

     Dura Foam (per bottle - 75 applications

     Jelly (per tube)    - 15 applications

     EMKO (per bottle)   - 25 applications

Assuming independence of methods (no use of two conventionals simultaneously) the conventionals listed by the Scheme will provide protection on nearly 2,500 million separate inter course occasions. Since the scheme intends to prevent about 3.2 million births in total using conventionals and assuming that protection on three hundred intercourse occasions will prevent one birth then under ideal (i.e. maximum efficiency) conditions nearly 8 million births could be prevented by the conventionals called for in the Scheme. However, efficiency in

use may be poor and if it requires the distribution of as many as

600 conventional "doses" to prevent a birth and an

adequate allowance for wastage and pipeline stocks is

also made, then taking these factors into account,

supplies of conventionals would seem barely adequate

for the job.

## APPENDIX A

The Brackett-Akers projections of Pakistan's population with
and without the family planning scheme is the only other effort
of which we are aware to quantify precisely the goals of the
scheme (9) their Assumptions and also their methodology differ
from ours but even so the results of the approaches are compatible.

Brackett-Ackers explain their methodology in considera-
ble detail (9, Appendix) so it will suffice for us summarize
the main points of difference:

1) They assume a base population of 115. million in
   1965 compared to 110 in this analysis which figure
   comes from the Commissioners Belgrade Population (4).

2) Their fertility assumption is expressed in terms
   of age-specific rates (not crude birth rates) and
   is thus more refined than ours. Their unchanging
   fertility assumption over the next five year
   yields a birth rate of between 50 and 55. Their
   1965 figure is about 52.

3) The fertility model (the age and parity specific
   rates ) Brackett - Akers employ is based on data for
   the Moslem Population of Albania and the Hutterite
   population of the U.S. Completed size of family is
   9.8 per female, some 40% above any estimates known
   to the present author for Pakistan (See : 11, 12;
   an analysis of unpublished children-even-born data
   collected in the 1961 census presently underway in the
   Institute of Development Economics shows a completed
   size of family of about 7, supporting the earlier
   conclusions reached by Hashmi and M.K.H. Khan)

4) Brackett - Akers assume the Scheme reaches
   maximum effectiveness in 1971, running a course of
   seven years. We assume a five year programme 1965-66
   to 1969-70 in line with the Scheme itself.

5) Brackett - Akers envision 25% of the women of
child-bearing ages adopting contraception,
"principally that of the intrauterine device
(IUD).. "(9,p.5). It then appears that they
assume zero fertility for the adopters during
the time they continue to practice contraception.
We, on the other hand, allow for the risk of
"accidental" pregnancies among the contrace-
ption at rates suggested by other studies. As
noted we also interpret 25 per cent "effectiv-
eness" to mean a 25 percent reduction in the
entire groups using conventional contraceptives.

6) Brackett - Ackers assume 25 percent of these
using contraceptives revert to non-planning
status every year. For the IUD group, we employ
the Scheme 's own estimates (75, 50, 35, 25, 10,
for the 1st, 2nd, 3rd, 4th, and 5th years respec-
tively). For the non-IUD planning group our
relatively low "effectiveness" rate (8 per 100)
allows for dropouts and inefficient users.

7) Brackett - Ackers assume a schedule for gradual
spread of coverage of the Scheme, beginning with
2 per cent for East and 15 per cent for West in
1965 building upto 100% for both by 1971/ We
have, on hand, assume a major effort at the
very outset (The Scheme calls for a 65 percent
coverage the first year) with the efficiency of the
conventional contraceptive programme gradually
rising.

## Appendix B

It may be of some interest to indicate precisely how we arrived at our estimates of births prevented in the various plans years.

1.) IUDs to be inserted in each year (and we are referring here as through out this paper to planning year on July 1, year X to June 30, year X plus 1) are indicated in the Scheme. In each year we assume the insations are made evenly month by month. (That is 600,000 annual insertions equal 50,000 per month.)

2.) "Conceptions-resulting-in-live-births" prevented were derived as follows:

(a) no-contraception pregnancy rate per 100 woman-years equals 33.0 according to Commissioner Adil's Belgrade paper.

(b) Pregnancy rate among 100 IUD **wearers in their first year** of use is computed as follows:

    (i) 1.5 per 100 woman-years is pregnancy rate of IUD wearers.

    (ii) But only 75 percent of any given 100 women inserted keep IUDs the whole year. The other 25 percent remove them after and average of 4.8 months of use, according to Commissioner Adil's Belgrade paper,

    (iii) Thus, the pregnancy rate among 100 women inserted for the first year after insertion equals:

(a) .75 times 1.5             equals   1.17

(b) .25 times 1.15 times 4.8/12    equals   0.13

(c) .25 times 33.0 times 7.2/12    equals   <u>4.36</u>

                       Total          5.66

    (iv) Thus, births prevented (as in our terminology, "conceptions-resulting-in-live-births" prevented equal 33.0 minus 5.66 or 27.34 per 100 woman-

years for first insertions.

(c) Pregnancy rates for IUD wearers and the births prevented
for second, third, fourth and fifth years of use are
computed in similar fashion except that percentage of
women retaining IUDs during these higher order year are
as follows:

    2nd - 67 percent
    3rd - 70 percent
    4th - 71 percent
    5th - 40 percent

These are, of course, derived from the retention rates
of 100 women during the entire five years shown by the scheme
(i.e. 75, 50, 35, 25, 10 respectively for 1st, 2nd, 3rd, 4th and
5th years.)

(d) The following "conceptions-resulting-in-live-births"
per 100 woman-years by year following insertion thus
result:

    1st year     27.34
    2nd year     25.19
    3rd year     25.83
    4th year     25.83
    5th year     20.06

(e) "Conceptions-resulting-in-live-births" prevented were
then obtaining by dividing the reciprocals of the
abovecoefficients into IUD's woman-years of use. In
other words, if 100 IUD's in their 5th year prevent
20.06 births, then it takes about 5 IUD per birth
prevented and if 100,000 IUD are in their fifth year
then 20,000 births are prevented.

(f) IUD woman-years of use for 2nd, 3rd, 4th and 5th years
are taken simply as the number in place at the
beginning of the year. The losses which take place

Appendix B

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arrived at our estimates of births prevented in the various plans
years.

1.)    IUDs to be inserted in each year (and we are referring
       here as through out this paper to planning year on July 1,
       year X to June 30, year X plus 1) are indicated in the
       Scheme. In each year we assume the insations are made
       evenly month by month. (That is 600,000 annual insertions
       equal 50,000 per month.)

2.)    "Conceptions-resulting-in-live-births" prevented were
       derived as follows:
       (a) no-contraception pregnancy rate per 100 woman-years
           equals 33.0 according to Commissioner Adil's Belgrade
           paper.

       (b) Pregnancy rate among 100 IUD **wearers in their first year**
       of use is computed as follows:   :
              (i)    1.5 per 100 woman-years is pregnancy rate of
                     IUD wearers.
              (ii)   But only 75 percent of any given 100 women
                     inserted keep IUDs the whole year. The other
                     25 percent remove them after and average of 4.8
                     months of use, according to Commissioner Adil's
                     Belgrade paper.
              (iii)  Thus; the pregnancy rate among 100 women
                     inserted for the first year after insertion
                     equals:

       (a) .75 times  1.5                     equals   1.17
       (b) .25 times  1.15 times 4.8/12       equals   0.13
       (c) .25 times 33.0   times 7.2/12      equals   4.36
                                      Total            5.66

              (iv)   Thus, births prevented (as in our terminology,
                     "conceptions-resulting-in-live-births" prevented
                     equal 33.0 minus 5.66  or 27.34 per 100 woman-

during the year are as we have seen, built into the
"conceptions prevented" coefficients per 100 woman-
years of use.  In the case of 1st year wearers the
number of IUD's in place on the average is about half
the total insertions in the year, assuming insertions occur
evenly overtime. Thus, about one-half the actual woman-years of
use which

would be given by total insertions times 1 actually occur in the year of insertion. The following "woman-years of IUD use " thus result:

| IUD Insertions | Year of use | | | | |
|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th |
| 1st year | 250,000 | 375,000 | 250,000 | 175,000 | 50,000 |
| 2nd year | | 300,000 | 450,000 | 300,000 | 210,000 |
| 3rd year | | | 320,000 | 480,000 | 320,000 |
| 4th year | | | | 340,000 | 510,000 |
| 5th year | | | | | 300,000 |
| | 250,000 | 675,000 | 1,020,000 | 1,295,000 | 1,390,000 |

(g) And "conceptions prevented", derived as explained above, are:

| IUD Insertions | Year of use | | | | |
|---|---|---|---|---|---|
| | 1st | 2nd | 3rd | 4th | 5th |
| 1st year | 68,348 | 94,463 | 64,575 | 45,203 | 10,030 |
| 2nd year | | 82,022 | 113,355 | 77,490 | 54,243 |
| 3rd year | | | 87,486 | 120,912 | 82,656 |
| 4th year | | | | 92,954 | 128,469 |
| 5th year | | | | | 82,020 |
| | 68,348 | 176,483 | 265,416 | 336,559 | 357,418 |

3)    IUD were assumed to begin protecting against pregnancy nine months after insertion. The period of time during which "prevented conceptions" would have yielded births is the year of use shifted forward in time nine months. The following illustration using the 1968-69 insertions may be helpful.

| Year of use (1) | Conceptions (births) prevented (2) | Timing of births prevented (3) | Births prevented related to years of use (4) |
|---|---|---|---|
| July 1968 ) | | April 1969 | 9,300 |
| June 1969 )1 | 92,954 | March 1970 | 83,654 |
| July 1969 )2 | 128,469 | April 1970 | 42,000 |
| June 1970 ) | | March 1971 | 86,000 |
| July 1970 )3 | | April 1971 | |
| June 1971 ) | | | |

In allocating births prevented per year to quarters (for moving from column (3) to column (4) it was assumed that 10% of "conceptions" prevented by first year IUD are prevented in the first three months of the year in question. This allows for the fact that is the first year the growing accumulation of insertions means that the greated protection is extended in the later months of the year. For 2nd, 3rd, 4th and 5th years of use, there is no such problem and conceptions prevented are assumed to be distributed evenly over the year. The following totals of birth prevented over time result:

| Year of Insertion | 1965-66 | 1966-67 | 1967-68 | 1968-69 | 1969-70 |
|---|---|---|---|---|---|
| 1965-66 | 6,800 | 92,550 | 85,000 | 48,000 | 33,000 |
| 1966-67 | | 8,200 | 111,800 | 100,000 | 70,000 |
| 1967-68 | | | 8,750 | 118,736 | 108,000 |
| 1968-69 | | | | 9,300 | 125,654 |
| 1969-70 | | | | | 8,200 |
| Total: | 6,800 | 100,750 | 205,550 | 276,036 | 344,854 |

*Nusrat*

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