CONSTRAINTS ON USE AND IMPACT OF CONTRACEPTIVES IN RURAL BANGLADESH : SOME PRELIMINARY SPECULATIONS

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PREFACE

The Cholera Research Laboratory (CRL) operates under a
bilateral project agreement between the governments of
Bangladesh and the United States of America. Research activi-
ties of CRL center on the interrelationships between diarrheal
disease, nutrition, fertility and their environmental deter-
minants. CRL issues two types of papers: scientific reports
and working papers which demonstrate the type of research acti-
vity currently in progress at CRL. The views expressed in these
papers are those of authors and do not necessarily represent
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ABSTRACT

This paper attempts to look at some findings
of the baseline KAP and subsequent prevalence surveys
of the Matlab Contraceptive Distribution Programme
and examine the impact of the programme on contraceptive
use and the expected demographic impact from such use.

The findings showed that contraceptive use rate
increased from 1.7 to 18.7 percent after 3 months
and then declined to 15.6 percent at 12 months after
the start of the programme. This level of use rate
can probably ensure a drop of 6 or 7 points per
thousand to a birth rate of 37 to 38, assuming a normal
CBR of 44 in Matlab before the start of the contraceptive
distribution programme.

The most striking finding of the KAP survey was
that 40 percent of those in need, i.e. those whose
desired family size is less than or equal to their
number of living children stated that they would not
use contraception in the future. The estimation of
current demand indicated a maximum likely use prevalence
rate of 15 to 20 percent of eligible couples which may
at best contribute a drop of 9 points per thousand in
the CBR. The demand for contraceptive appeared to
remain low until significant changes could be made in
the desire for children, and particularly in the
strong preference for sons.

INTRODUCTION

The debate over the best route to fertility decline--social and economic development versus aggressive family planning programs--has been termed the major controversy in demography (Berelson, 1975). Many demographers believe that significant fertility decline is possible only after, or in concert with, socioeconomic development (Hauser, 1971; Blake and Das Gupta, 1975). However, others claim that family planning is the only means of achieving reduction in fertility over the short-run (Cassen, 1975), or, more forcefully, that the availability of contraceptives and abortion is all that is required to have a rapid and significant impact on fertility (Ravenholt and Chao, 1974).

The contraceptive distribution program described below is designed to test the effect of family planning on fertility in the absence of significant socioeconomic development. This report will describe the prevailing situation of contraceptive use before the start of the program, look briefly at changes in use during the first year, and discuss some of the social and attitudinal factors believed to affect contraceptive use.

The Contraceptive Distribution Program

The area selected for this program was the Matlab field research area of the Cholera Research Laboratory, Dacca, Bangladesh. The Matlab area consists of 236 villages with a population of about 236,000. The population is entirely rural, with 55.4 percent of employed males between 15 and 60 years of age reporting agriculture as their primary occupation. Literacy is low. Only 13.4 percent of males over 5 years of age and 3.2 percent of similar females have more than five years of schooling. Fully 56 percent of men and 74 percent of women have no formal schooling at all. The data contain no adequate measure of income or wealth. Suffice it to say that the vast majority of the rural population in all areas of Bangladesh is poor on any economic standard. Matlab is no exception. Despite the extensive research carried on in this area during the past several years Matlab remains a traditional area.

For the purposes of the contraceptive distribution program the Matlab area was divided into two parts of roughly equal size : a treatment area and a control area. The control area included the main market place and was generally closer to governmental, educational, health and preexisting family planning services than the treatment area. However, this makes little difference in the relevant characteristics of the populations of these areas.[1a]

Distribution of contraceptives began in October, 1975. During the initial round, distribution was carried out by educated males working in conjunction with illiterate or marginally literate females. The pill received the greatest emphasis, though condoms were also available. Those willing to accept contraceptives were given 6 cycles of oral pills or 18 condoms, if they preferred, and instructions on proper use. Acceptance in this case does not imply use. Women were encouraged to take and keep the contraceptives even if they had no plans to use them.

In subsequent rounds the males gradually assumed a supervisory role. Females took responsibility for continuing distribution to new acceptors and resupply of users. Each female covers an area with about 1000 total population and approximately 150-200 eligible couples. They visit every house in their area almost every day. The contraceptive distribution work is combined with other activities and takes about 25 percent of the female worker's time. They tend to be well known and carry the contraceptives in a distinctive red bag.

In theory the distribution workers were to provide no motivation other than to say that child spacing is good for health. In practice it proved difficult to provide instructions on contraceptive use without entering into a discussion of the advantages and disadvantages of contraception. Thus there was an inevitable tendency to provide more motivation than had been planned.[1]

This report examines data from a baseline survey conducted in late 1975 just before distribution began

and includes information on contraceptive use at
3 months and 12 months after the start of distribution.
These data are from quarterly prevalence surveys. The
sample is a selfweighting two stage selection of
households. All married females 15-44 years of age
living in each sample household were eligible
respondents. A total of 1058 interviews were completed.

Background and Baseline

As noted above fertility in Bangladesh and in
Matlab is very high. In 1973, for the first five year
plan, Bangladesh estimated a crude birth rate (CBR)
of 47 with a crude death rate (CDR) of 17 resulting
in a crude rate of natural increase (CRNI) of 3 percent
per year. Preliminary analysis of the 1974 census yields
an estimated rate of growth of 2.5 percent per year for
the decade of the 1960's (Rabbani, et al., 1976). The
CBR calculated from the Matlab vital registration
system has been in the mid to low 40's from 1967-68
to 1973-74.[2] During this period Matlab's CRNI ranged
between 2.5 and 3 percent per year. In our sample
population, women 40-44 have a mean parity of 7.79
births and an average number of living children of
5.37. These figures are consistent with the crude rates
found in the vital registration.

Given the already large population and extremely
high population density of Bangladesh, these high rates
of natural increase have led the government to declare
population control the number one development priority.[3]
A number of programs have been and are being tried in an
effort to reduce the birth rate. However, despite the
efforts of a nationwide family planning program,
contraceptive use has remained low in Bangladesh. The
Impact Survey conducted in the late 1960's found that
3.6 percent of eligible couples were currently
practicing some form of contraception. Another 2.4
percent had used some type of contraception in the past,
but were not currently using (Impact Survey, 1971,p.35).
Use in Matlab is apparently somewhat higher than this.
Among married women 15-44, 7.9 percent claim to be
currently using, while an additional 6.5 percent have

used at sometime in the past. However, only 2.4 percent
are currently using modern methods[3a] and there is
evidence that current use of traditional methods was
overreported by some interviewers.[4]

Results of the Contraceptive Distribution Program

The first round of contraceptive distribution
began on October 15, 1975. The methods available were
pill and, to a lesser extent, condom. Every 3 months
a survey was conducted to measure the prevalence of
use. Because of the nature of the program and the type
of question asked on the prevalence survey, there was
a tendency to report only use of modern methods--
particularly pills and condoms.

Despite this minor deficiency in the data, there
was a clear and striking increase in contraceptive use
in the distribution area. Assuming that all use
reported in the quarterly prevalence survey is of modern
methods, the use of these methods in the distribution
area increased from 1.7 percent before the start of the
program to 18.7 percent after 3 months and then declined
slightly to 15.6 percent at 12 months after the start
of the program.[5] In the control area, on the other hand,
use remained virtually constant at 2.7 percent at the
baseline, 3.8 percent at 3 months and 3.9 percent at 12
months. Clearly, the ready availability of contraceptives
had a large impact on use. The impact was immediate and,
despite the slight drop in prevalence due to the process
of equalizing discontinuers with new acceptors, appears
to be sustained.

Table 1

Percent using modern contraceptive methods, by
time   and area, Matlab

	Baseline	3 Months	12 Months
Treatment	1.7%	18.7%	15.6%
Control	2.7%	3.8%	3.9%

Demographic Impact

Having achieved and documented this increase in contraceptive use, it is necessary to estimate the demographic impact expected. There are a number of complicated models available to evaluate this question. However, these require a great deal of data and provide detailed results beyond the needs of the present paper. Here it is sufficient to use two crude indicators of the decline in the CBR resulting from increasing contraceptive use. These are: a) the birth rate drops 1 percent for each 1 percent increase in modern contraceptive use; b) the 30/30 rule of thumb (Berelson, 1974, p.34). This latter simply assumes that areas with 30 percent of eligible couples using contraception will have a CBR of about 30. For every 1 percent increase in contraceptive use from zero to

30 percent the birth rate drops about $\dfrac{CBR - 30}{30 - Current \% Use}$ points per 1000. Thus, if a country with no contraceptive use had a birth rate of 50, for every 1 percent increase in contraceptive use its birth rate would drop .67 points per thousand. When 30 percent of eligible couples were using contraception its CBR would be 20 points lower at 30 per thousand.

In Matlab, assuming a normal CBR of 44 before the start of the distribution program, these indicators suggest a drop of about 6 or 7 points per thousand[6] to a birth rate of 37 to 38. The reader should note that this is only a rough estimation, believed to be somewhat lower than would actually result from this level of use.[7]

Table 2

Indicators of decline in the crude birth rate, Matlab

a) Modern use before start of program   1.7%

    Modern use after 1 year   <u>15.6%</u>

    Increase in use   13.9%

    CBR before start of program   44/1000

    Estimated decline in the CBR   44 x .139 = 6.1/1000

b) $\dfrac{CBR - 30}{30 - Current\ \%\ Use}$ = points decline in CBR for 1 percent increase in contraceptive use

$$\dfrac{44 - 30}{30 - 1.7} = .49$$

Estimated decline in the CBR   13.9 x .49 = 6.8/1000

    Thus, though the program has had considerable impact on contraceptive use, the expected demographic impact of the use to date is small. However, there are those who would argue that as women learn of the ability to control their fertility through exposure to a comprehensive and accessible family planning program contraceptive use will increase greatly (Ravenholt, 1969). It is possible to estimate the current demand for contraception, and in this way determine the potential maximum impact of the contraceptive distribution program were it to fully satisfy this demand.

    The first step in the estimation of demand is the computation of current contraceptive "need". This is done by comparing reported desired family size[8] with

the number of living children the respondent has.
Those women whose desired family size is less than or
equal to their number of living children are
considered to be currently in need of contraception.
By this definition 38.4 percent of all sample women
(47.3 percent of those for whom need is defined[9]) were
currently in need of contraception. Table 3 shows that
only 13.3 percent of those in need were using
contraception, leaving 87 percent of the women who
have already achieved or exceeded their desired family
size unprotected. However, fully 40 percent of those
in need state that they will not use contraception in

the future. This leaves only 14.9 percent $(\frac{.387 \times 406}{1058})$
of all eligible women (18.3 percent of eligible women
for whom need is defined) both in need and disposed
to use contraceptives, a better estimation of unmet
demand. Added to the 7.9 percent currently using
suggests a maximum contraceptive prevalence of about 23
percent. Discounting this for women currently pregnant
(6.7 percent of those in need) and women in early
postpartum amenorrhea (unknown)[10] the maximum likely
prevalence rate is probably more on the order of 15-20
percent of eligible couples.

Table 3

Use and Attitude toward use by need, Matlab, Baseline KAP

Need Status	Using	Use and Use Attitude Would Use	Would Not Use	DK	Total	(N)
Need	13.3%	38.7	40.1	7.9	100.0%	(406)
No Need	6.2%	44.2	40.8	8.8	100.0%	(453)
Need Undefined	1.0%	11.1	65.3	22.6	100.0%	(199)
Total	7.9%	35.8	45.2	11.1	100.0%	(1058)

As seen in Table 1, this is approximately what the program has been able to achieve. Table 4 shows that, as expected, most of the increase has been among those in need. However, there has been some increase in use among those in the treatment area who are not in need. While some of this may be due to women achieving their desired family size during the intervening period, it also suggests that ready access to contraceptives may encourage women to space their births as well as to terminate childbearing once they have the number of children they want.

Table 4

Percent currently using modern methods by Need,

Area and Time, Matlab.

	Baseline Need	No Need	3 Months Need	No Need	12 Months Need	No Need
Treatment	3.9%	0.4%	32.6%	8.7%	24.7%	8.7%
	(205)	(257)	(181)	(208)	(194)	(229)
Control	6.9	1.0	6.7	1.2	7.5	0.6
	(201)	(196)	(178)	(168)	(86)	(171)
Total	5.4	0.7	19.8	5.3	16.3	5.3
	(406)	(453)	(359)	(376)	(380)	(400)

The two methods for estimating demographic impact described above indicate that if 20 percent of eligible couples were to use contraception the CBR would drop about 9 points per thousand to about 35. Assuming constant mortality this implies the natural increase of the population would continue at about 1.5 to 2 percent per year. While this is a considerable improvement over the present situation, it does not represent a solution to the "population problem" of Bangladesh.

Meeting the demand for contraceptives will not solve the population problem because women in Matlab, as in other places (Sirageldin, et al., 1975; Fine and Pless, 1973) want more children than are required for replacement fertility and eventual zero population growth. The average of 4.5 children desired by the sample women is sufficient to double the population about once per generation, i.e. about every 28-30 years, assuming constant mortality. Moreover, as shown in Table 5, young women want almost as many children as the oldest women. This suggests that by the time women who are currently 15-19 complete their fertility, they could have as many children as women currently 40-44.

Table 5

Mean desired family size by Age, Matlab, Baseline KAP.

| | Age | | | | | | |
	15-19	20-24	25-29	30-34	35-39	40-44	Total
Mean Desired Family Size	4.47	4.30	4.52	4.56	4.76	4.77	4.56
% Non-response	24.0	23.6	14.2	17.4	18.8	13.4	18.8
N (Excluding Non-response)	(130)	(152)	(157)	(181)	(130)	(110)	(860)

This approach to estimating contraceptive demand and demographic impact has been severely criticized. There are two aspects to the criticism: 1) questions on desired family size are inherently invalid (Westoff and Ryder, 1977); 2) even if such question are valid in the absence of a comprehensive contraceptive distribution program, demand as computed above will underestimate the actual demand once the program is operating and women come to learn of opportunities to regulate their fertility (Ravenholt, 1969).

The first criticism may be addressed with the
Coombs scales (L.C. Coombs, 1975). These scales yield
a measure of preference for large versus small families
and for sons versus daughters or a balanced sex
distribution. The scales are ordinal, thus the scales
scores do not represent the respondent's preferred
number of children or number of boys and girls. Rather,
the scores indicate underlying preference or bias for
bigness or smallness; or, in the case of the sex
preference scale for sons or daughters or a balanced
sex distribution.[13] The Coombs scale has been shown
to have very high predictive validity of future
fertility expectations for a sample of women in Detroit,
U.S.A. (L.C. Coombs, 1974b).

Table 6 Panel A shows that women in Matlab have
a very strong preference for large families. The
distribution of scores for Matlab is similar to, though
slightly higher than, that for Malaysia, the country
with the strongest large family bias among those for
which Coombs scales are available to date. The
comparison with the USA shows the tremendous difference
between Matlab and a country where fertility is low and
average completed family size is close to the two child
norm required for eventual zero population growth. Taiwan,
a country that has experienced recent rapid fertility
decline has a distribution favoring middle sized families
far more than the distribution for Matlab.

The sex preference scores found in Matlab are even
more striking. They indicate a very strong bias for sons.
This is understandable because of the importance of sons
to the economic welfare of the family (Cain, 1977).However,
this suggests that as a result of the very strong preference
for sons, some women will have more children than they
want in order to ensure the survival of the desired
number of sons.

Table 6

Panel A

Coombs Size preference scales for Matlab and selected countries

	Small Family Preference					Large Family Preference		
	IN1	IN2	IN3	IN4	IN5	IN6	IN7	(N)
Matlab	0	2	2	16	26	15	39	(847)
Malaysia	0	0	0	20	32	24	23	(688)
Taiwan	0	5	7	28	36	23	2	(5463)
USA	5	20	20	24	17	7	6	(7459)

Panel B

Coombs Sex preference scale for Matlab and selected countries

	Strong Girl Preference		Balanced Sex Preference				Strong Boy Preference	
	IS1	IS2	IS3	IS4	IS5	IS6	IS7	(N)
Matlab	1	1	1	5	19	38	35	(844)
Malaysia	2	3	9	19	36	24	8	(386)
Taiwan	0	0	1	10	54	33	2	(5386)
USA	3	8	22	20	29	15	4	(6897)

The age-specific Coombs scores also show very similar distributions for all age groups. (Data not shown) This again indicates that young women want about the same number of children and sex distribution as older women, and can therefore be expected to have similar completed

family sizes. If this is accurate, fertility is unlikely to decline significantly for some time to come.

There is nothing in the present data that allows evaluation of the second criticism of the estimate of contraceptive demand used above. Some demographers have taken exactly the opposite point of view, arguing that women may have more children than they say they want because social and economic pressures keep them from restricting their fertility when they achieve their desired family size (Davis, 1967). However that may be, further research planned for the contraceptive distribution program will permit evaluation of the effect of availability on use,[14] as well as on family size preferences and other attitudinal variables.

Summary and Conclusions

The results presented above show very clearly that provision of contraceptive services alone can have a substantial impact on contraceptive use over the short run. However, the results are less encouraging in terms of the expected demographic impact from the levels of use achieved to date or from likely continued improvement in contraceptive prevalence. It appears that demand for contraceptives will remain low until significant changes are made in the desire for children, and particularly in the strong preference for sons.

If this is the case, the best policy for the government to persue would be to maximize availability while minimizing the cost of distribution. This can probably best be done through a simple program like the contraceptive distribution program, using existing government personnel.[15] If this approach is taken, officials must not become discouraged if only limited results are achieved. On the contrary, limited results are to be expected until there is substantial improvement in other social and economic factors.

FOOTNOTES

1a. The women in the treatment area are slightly
   younger, have somewhat fewer children, and want
   a bit smaller family than the women in the control
   area. However, the differences are small and
   unlikely to have any significant impact on the
   results of the distribution program.

	Average Age	Average Number of Living children	Average Desired Family Size
Treatment	29.06	3.15	4.49
Control	29.53	3.48	4.64

1. This description of the distribution program
   draws heavily on : Khan and Huber, 1976. See
   also : People, 1976, for a more complete discussion
   of the program.

2. The CBR for the two years 1974-75 and 1975-76 is
   considerably lower. However, this is thought to be
   a short-term phenomenon due mainly to the flooding
   in 1974 and the economic crisis of 1974-75. There
   is evidence that the CBR is once again at about the
   level seen during the period 1967-68 to 1973-74.

3. The actual commitment to this goal appears to be
   variable. In early 1977 an overly zealous family
   planning program was widely believed to have
   contributed to the political downfall of Indira
   Gandhi of India. Perhaps as a reflection of that
   belief, the Bangladesh Government's 19 point program,
   issued at about the same time, listed "check
   population explosion" as point 15. During the
   subsequent campaign for a referendum (held May 30,
   1977) on this program, the three points most
   mentioned were : 1) increase food production;
   2) increase literacy; 3) develop rural cottage
   industry. Despite these signs it is claimed that
   the commitment to family planning remains. Indeed,
   by June, 1977 discussion of family planning and
   population control was again appearing in government
   plans and in the newspapers.

3a. For the purposes of this paper modern methods
include: oral pills, condoms, IUD, injectable
steroids, sterilization, foam and other chemical
or mechanical means of preventing conception.
Traditional methods include: rhythm, abstinance,
withdrawal and all folk practices believed by the
local population to prevent pregnancy.

4. One interviewer had a tendency to overreport use
of the rhythm method. Among rhythm users, 66
percent were reported by this single interviewer.
A special effort was made to check these reports
by reinterviewing some of these respondents. In
this group 66 percent did not report rhythm use in
the reinterview. If the reports of rhythm use by
this interviewer are proportionately discounted,
contraceptive prevalence was 6 percent. Another
interviewer reported disproportionate use of
withdrawal and abstinence. This was not so striking
and was not specially checked. In all tables
contraceptive use is based on the initial reports
of all respondents uncorrected for possible
overreporting.

5. The 3 and 12 month use rates given here are slightly
higher than those in the reports of the contracep-
tive distribution program. This is a result of
bias in my data introduced by excluding absentees
from analysis. The absentees at any given time
tend to be younger and of lower parity than the
population as a whole. Therefore, the absentees
tend to be less likely to use contraception. Because
the 3 and 12 months rates reported here are based
on those present at the time of the prevalence survey
among those present for the baseline KAP survey,
there is a double bias that tends to inflate the
use rate in these data over the more accurate but
also slightly biased rates based on those present
at any particular cross section.

6. Though these two estimates tend to produce similar
results, this should not be interpreted as proving
the validity of the estimated decline in the CBR.
These are only very crude estimates and may be
considerably in error.

7.   This is because the prolonged amenorrhea, low
     natural fecundability and poor continuation
     rates believed to characterize Bangladeshi users
     result in relatively little extention in the
     closed birth interval of acceptors. For a
     discussion of this issue in a different context
     see: Langsten, et. al., 1977.

8.   The question used to measure desired family size
     was: "Many people do not have to expect to have
     the number of children they most want. If you
     were just getting married, how many children would
     you most like to have when you are through having
     children?" The initial response to this question
     tends to be highly fatalistic. However, with
     patience and probing non-response was reduced
     considerably. In the total sample non-response
     to this question was 18.8 percent.

9.   Contraceptive need is undefined for the 18.8 percent
     who gave a non-numerical response to the question
     on desired family size.

10. An effective contraceptive distribution program
     should reduce both of these factors over time,
     by helping to keep women in need from becoming
     pregnant and giving birth.

11. These are the results for the total sample. The
     findings are similar for the treatment and control
     areas separately, although non-response tends to
     be higher and the other groups somewhat reduced
     in the control area.

12. This table includes only women for whom need is
     defined. Table 3 shows that women for whom need
     is undefined have very low contraceptive use and
     a strong resistance to future use at the time of
     the baseline survey. At 3 and 12 months only
     women who were present for both the baseline and
     the respective prevelance survey are included.
     See footnote 5 for a discussion of the bias this
     latter restriction introduces.

13. More specifically, the scale scores range from 1
     to 7. In the case of the size preference scale

a score of 1 indicates a preference for a small
family; a score of 7 a preference for a large
family; and a score of 4 a preference for a
middle sized family. For the sex preference
scale low scores indicate a preference for girls,
with a score of 3 indicating a weak girl bias and
1 indicating a strong bias for girls. High scores
indicate a preference for boys; 5 a weak preference,
7 a strong preference. A score of 4 on the sex
scale indicates a preference for a balanced sex
distribution, i.e. the same number of boys and
girls. For a complete description of the theory
underlying the scales see: C.H. Coombs, et al.,
1973. The form of question used with the Matlab
sample was a mix of the two short forms described
in L.C. Coombs, 1974a.

14. The contraceptive distribution program has recently
been restructured to improve motivation and follow-
up and to expand the range of contraceptive methods
offered to include clinical methods as well as
pills and condoms available during the first year.
Also a new group of better educated female workers
will be hired to concentrate on contraceptive
distribution and field subcenters will be construct-
ed to provide clinical and back-up services within
a reasonable distance of a woman's home. This
improvement in scope and quality of services offered
will help to ensure that the program has the maxi-
mum impact possible from the provision of services
alone.

15. This has been odne at the Companiganj Health Project,
an experimental integrated health and family
planning project in another rural area of Bangladesh.
The Companiganj project has achieved a level of
contraceptive use similar to that of the Matlab
contraceptive distribution program.

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