MEASURING THE EFFECTIVENESS OF A FAMILY PLANNING PROGRAM: TAIWAN'S EXPERIENCE

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Introduction

A large number of family planning programs under government auspices has come into operation in the last three or four years in developing countries in various parts of the world and many more are being planned for implementation soon.[1] In view of the fact that most of these programs are officially or unofficially tied in with their economic development programs and are driven by a sense of urgency, there is pressure for quick evaluation of the on-going operations even as there is need for efficient assessment of their long-term effects. This pressure and need must be met by the increasing number of statisticians, demographers, and social scientists who are being called upon to work with the administrators of the programs for such purposes.

The task of the statisticians, demographers, and social scientists involved in these programs would be to ensure the collection of appropriate data either routinely as part of the recording systems of the programs or by special studies to measure the impact of the programs on factors that would ultimately affect the birth figures and to analyze the data quickly and to interpret them within the framework of the program objectives. Where accurate routine systems of vital registration and population accounting are absent, they must also help in devising ways to obtain accurate estimates of vital events cheaply and quickly so as to be able to measure changes in their rates, when they occur.

Most family planning programs in the developing countries have as their objectives: (1) the increase in the effective use of contraception among a significant proportion of the population in the reproductive ages, and (2) the decline in over-all fertility to a level consistent with a population growth rate considered to be commensurate with their projected economic growth rate. The evaluation of the programs then must show the progress in the number of effective users of contraception and the change in fertility level and specify how these are related to program efforts.

I have been asked by the organizer of this session to describe the evaluation efforts of the family planning program in Taiwan in general terms with some reference to the statistical problems involved. Taiwan serves merely as an example. The program there has enjoyed relatively good success in the short time that it has been in operation and its progress has been unusually well documented. Furthermore, in their effort to evaluate the program effects, some challenging problems have come up. But before introducing these problems, let me briefly describe the family planning program itself and some of the major results to date.

Taiwan's Family Planning Program[2]

Taiwan's family planning program, launched on a large scale in 1964, aims to bring the island's population growth rate that was 3 per cent in 1963 down to about 2 per cent by 1973. To achieve this aim, which is believed by economic planners there to be consistent with their development plans, the birth rate which stood at 36.3 per 1,000 in 1963 must be reduced to about 24. The program, under the auspices of the Provincial Health Department and promoted ostensibly for health purposes alone, hopes to achieve this aim by having 600,000 married women in the ages 20-44 inserted with the new intrauterine contraceptive (IUCD), by 1969. This would amount to securing about 40 per cent of the island's 1.5 million married women 20-44 on the IUCD.

Some 300 field workers are employed full-time to promote the IUCD in local areas throughout most of this island of 12 million inhabitants. In addition to their educational efforts, they distribute coupons to interested women, who are instructed to go to a nearby doctor authorized by the program to make IUCD insertions. Doctors themselves and other health personnel also are authorized to distribute these coupons. The coupon entitles the woman to a 50 per cent discount on the insertion fee (US$1.50). The doctor in turn upon presentation of the coupon receives from the program a subsidy to make up the difference (US$.75). At present some 600 specialists and general practitioners, mostly in private practice, are authorized by the Provincial Health Department to make IUCD insertions under this scheme.

Monthly and annual targets are set; and, when insertions seem to be lagging, special "gimmicks" are introduced to boost them. For example, insertions have been offered free of charge for a limited time period in some of the areas and special fees have been offered to persons referring cases--with good effect.

While the program so far has relied almost exclusively on the IUCD, because of problems with respect to its retention rate which at present seems to be much lower than it was initially expected, plans are under way to offer the oral pill along with the IUCD.

Taiwan's program stands unique among family planning programs in the fact that it has been guided from the start by a strong evaluation team in the Taiwan Population Studies Center, which was established in 1961 under financial support from the Population Council of New York and operated in technical cooperation since 1962 with the University of Michigan Population Studies Center. It was through the facilities of the then nascent Taiwan Population Studies Center that in 1963 an

experimental program to test the relative efficiency of different modes of communication and the acceptability of the IUCD was undertaken in Taichung City, the capital of this island province of the Republic of China.[3] The Taichung Study, as this experiment has come to be known, has served as a guide in planning and implementing the island-wide program which is now in its third year of operation. The Taiwan Population Studies Center, now equipped with its own IBM key-punch and sorter, effectively carries out the important task of evaluating the operations of this expanded program on a current basis.

Major Achievements to Date[4]

In 1964, the target was to have 50,000 women inserted with the IUCD. 93 per cent of this target was reached. In 1965, 100,000 insertions were aimed at and 99 per cent was achieved. The target for the current year is 120,000; at mid-year about 50 per cent of the target has been reached. From 1964 through mid-1966, more than 200,000 insertions have been made. This amounts to more than 13 per cent of the island's married women 20-44 years of age.

The crude birth rate declined 10 per cent from 36.3 in 1963 to 32.7 in 1965. The rate of natural increase slowed down somewhat from 3.0 per cent in 1963 to 2.7 per cent in 1965. (The crude death rate declined from 6.1 to 5.5 between 1963 and 1965.) It is especially noteworthy that the rate of decline in the birth rate has been accelerated since the start of the island-wide program in 1964: it declined 2.5 per cent between 1961-62; 2.9 per cent between 1962-63; 4.7 per cent between 1963-64; 5.5 per cent between 1964-65; and 6.6 per cent between 1965-66 for the first four months.

In Taichung, where the intensive experimental program was undertaken in 1963, the crude birth rate declined by 5.4 per cent between 1963 and 1964, more than twice the rate of decline (2.6%) during this period in the four other major cities combined and somewhat more than the rate of decline (4.7%) for the province as a whole. In the previous year, the decline in Taichung (2.6%) was lower than the decline in the other major cities (3.9%) and in the province as a whole (2.9%). The accelerated decline in 1963-64 in Taichung undoubtedly can be attributed to the large number of IUCD insertions made there during the intensive program. This advantage in Taichung, however, was not carried through to 1964-65 as the program was effectively extended into the other cities and counties throughout the island.

How the Program is Being Evaluated[5]

1. Fertility Measures from the Household Register

Taiwan, unlike most developing countries, has the advantage of an unusually accurate household registration system from which birth and death data can be obtained within a month or two of their occurrence in every one of her 22 cities and counties. What is more, not only crude birth rates but also age-specific fertility rates and hence general and total fertility rates for any given year are available for each of her 361 townships by the end of the first quarter of the following year. The easy availability of these rates permits quick evaluation of program effect in the most telling way. After all, whatever else may happen as a result of the program it must ultimately show in fertility decline if it is to be judged effective.

We now have at Michigan a deck of IBM cards on which are punched several demographic and socioeconomic characteristics of each of the 361 townships. We plan to add to this deck the IUCD insertion rates by age groups and a recent set of age-specific fertility rates, among other things, so that we may learn how the program efforts interact with pre-existing conditions in the local communities to affect their fertility levels.[6] There is evidence from a recent study that the fertility levels before the program varied systematically with the socioeconomic characteristics of these townships. The program presumably aims to facilitate fertility decline in all communities by having its effect cut across the pre-existing differentials. How this happens, if it does, needs to be specified for program evaluation and guidance, and fortunately in Taiwan this can be done rather easily.

2. IUCD Insertion Figures from the Coupons

The IUCD insertions themselves are tallied by each township within 10 days following the month in which they occur by the use of the coupons, which we referred to earlier as entitling the holders to a 50 per cent discount on the insertion fee. The coupons, on the basis of which the subsidies are administered, are collected monthly from the inserting doctors and sent to the Taiwan Population Studies Center by the 7th day following the end of the month for quick analysis.

The coupon contains not only the names and addresses of the case and the inserting doctor and the date of insertion but also such other items of information as: the woman's age, the number of living children and sons she has, the name and category of person by whom she was referred, the education attained by her, whether she wanted more children, the last method of contraception she and her husband used, and the date of her last child birth. These information are immediately punched on IBM cards and runs are quickly made for the monthly report that is prepared for evaluation purposes.

Here is a system that is built into the administrative routine of the program and at the same time provides data useful for evaluation on a current basis. The Taiwan Population Studies

Center has been able to make the following kinds of evaluation from this source:

a. Measure the progress of the program in the province and in each township in terms of the target set for the month. Problem areas are easily detected and because of the rapidity with which data become available corrective measures can be taken very quickly.

b. Obtain the number of IUCD insertions in a given month attributable to each worker, thus getting some measure of work efficiency.

c. Obtain the cumulative IUCD insertion rates per 100 married women 20-44 in the province and in each of the 361 townships to measure the progress of the program, which aims ultimately to reach 40 per cent of the women in the reproductive ages.

d. Measure the progress of the program in terms of the types of persons it is reaching: age groups, parity, past use of contraception, recency of child birth, and educational strata. Generally speaking, the program has tended to attract initially those past age 30, with 3 or 4 children and one or two sons, those who have already tried something in the past to check their family growth, and those who only recently had a live birth. Education has not shown too much difference. It is hoped, of course, that the program eventually will attract the younger women with fewer children and sons, those who have never before tried birth control, etc.--in short, to get married women to take up contraception earlier for spacing as well as for limitation purposes.

In computing the rates of IUCD insertions, we are confronted with the question as to whether it is realistic to use all married women in a given age range as base. In Taiwan, not a few women are already sterilized or using contraception that is satisfactory to them. If we can estimate the number of women so protected, we should be able to remove them from the base as ineligible. In Taichung, for example, where our target population was the married women 20-39 years of age, the acceptance rate from the start of the program to July 31, 1965, was calculated to be 20 per cent when all married women 20-39 were used as base but 27 per cent when those already sterilized or using satisfactory contraception were excluded from the base. The reason why education does not seem to make much difference is that more of the better educated are already protected either by sterilization or contraception. In fact, when acceptance rates in Taichung were computed on bases excluding the already protected, a direct relationship between education and acceptance did obtain. What we are saying in effect is that rates calculated on bases that are heterogeneous are not comparable with each other and interpretations can be misleading or unrealistic unless the heterogeneity is taken into account. From an administrative point of view, too, to assign a uniform target for all workers without regard to the composition of the base population of the area in which each works can be unfair and damaging to worker morale.

3. Island-wide Survey

In Taiwan fertility has been declining consistently from at least 1958. There is evidence that not a few women were already sterilized, using contraception, and even resorting to illegal abortion before the family planning program got under way. It is likely that even now not an insignificant number of women are taking up contraception or other forms of birth control on their own through non-program facilities. Some of these may be influenced by the program even if they may use facilities outside of the program. The full impact of the program then cannot be assessed merely by tallying the IUCD insertions reported by the doctors participating in the program. Besides, over-all fertility is going to be affected by birth control practices whether in or out of the program. The first of a series of biennial sample surveys covering the entire island population of married women 20-39 was taken in the fall of 1965, and the data are being analyzed currently to gauge, among other things, the prevalence of birth control practices in Taiwan irrespective of the program. The surveys over the years will permit an assessment of the changes in knowledge, attitude, and practice with respect to family planning as the program is intensified. In addition to providing data to trace the program influences on these changes, they will provide a basis for estimating the impact of the various practices on over-all fertility.

4. IUCD Follow-up Survey

A medical follow-up study of the IUCD cases in the Taichung program has revealed that as much as a half of the original cases fail to retain the IUCD after two years and some of them, albeit a small percentage, do get pregnant even with the device in place. Needed are estimates of both the retention rates and the failure rates for different periods for the cases getting the IUCD in the island-wide program. It is also important to know what proportion of those who discontinue do so voluntarily, what proportion of the discontinued cases take up other measures to protect themselves against further growth of their families, how the pregnancies that occur from device failure are disposed, and the extent to which there are demographic and socioeconomic differentials in these. To get these and other related information on those who take the IUCD in the national program, a follow-up survey of a sample of cases is being carried out on an annual basis. The techniques of measurement being developed by

Dr. Potter will be applied to the data from the sample surveys as they have been applied to the data from the Taichung medical follow-up study.

A Major Unsolved Problem

The most serious problem confronting the evaluation effort in Taiwan is that at present no one knows with any precision what fertility decline to expect given: (1) the large number of IUCD insertions in the program, (2) the considerable use of contraception, sterilization, and induced abortion outside the program, (3) the varying failure rates associated with the IUCD and other contraceptive methods, (4) the unusually high discontinuation rates of the various contraceptive methods, including the IUCD, that are adopted, (5) the fact that not a few women were already using various methods of birth control even prior to the program, and (6) the fact that birth control practice in or out of the program is variously selective with respect to age, parity, fecundity, social status, etc. The problem is complicated further by the fact that the effect of contraception on the fertility of a woman is not always easily differentiated from the effect of her fecundability, which is affected by her age, parity, recency of live birth, lactation experience, etc. What is more, not only is there selectivity with respect to these characteristics in acceptance of the IUCD and its retention but also this selectivity changes over time. The complexity of the situation would seem to call for a mathematical model that might be simulated on a computer. To bring all of these factors into a workable model obviously is no easy task especially when these factors are variable over time, but the need is there and the challenge stands before us.[7] Taiwan is one place where the necessary data can be and are being collected and where once the model is in working order it can be empirically tested. The implication for program planning is that such a model would enable us to determine the size of the program required to achieve a specified goal with much greater specificity than we are able to at present.

Footnotes

1. For a review of world developments in this field, see: Berelson, B., et al (eds.), Family Planning and Population Programs, University of Chicago Press, 1966.

2. For a detailed description of Taiwan's family planning program, see: L. P. Chow, "A Programme to Control Fertility in Taiwan," Population Studies, XIX, No. 2 (November 1965), 29-39.

3. For a description of the Taichung experiment and some early results, see: Bernard Berelson and Ronald Freedman, "A Study in Fertility Control," Scientific American, CCX, (May 1964), 29-39. For a summary of more recent results, see: Ronald Freedman and John Y. Takeshita, "Studies of Fertility and Family Limitation in Taiwan," Eugenics Quarterly, XII, No. 4 (December 1965), 233-250.

4. Based on the monthly reports prepared by the Taiwan Population Studies Center, Taichung, Taiwan.

5. For a detailed description of the evaluation procedures used in Taiwan, see: L. P. Chow, "Evaluation Procedures for a Family Planning Program," in Berelson, et al (eds.) Family Planning and Population Programs, pp. 675-689.

6. Andrew Collver, Alden Speare, Jr., and Paul K. C. Liu, "Local Variations of Fertility in Taiwan," University of Michigan Population Studies Center. Submitted for publication.

7. For an interesting preliminary attempt along this line with some of these factors taken into account and applied to the family planning program in Korea, see: Byung Moo Lee and John Ibister, "The Impact of Birth Control Programs on Fertility," in Berelson, et al (eds.), Family Planning and Population Programs. pp. 737-758.