Providing Maternal and Child Health-Family Planning Services to a Large Rural Population: Results of the Bohol Project, Philippines

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Abstract: The Bohol Project (1975–1979) sought to improve maternal and child health and to increase the use of family planning among a rural Philippine population of 400,000. Research indicated that maternal and child health (MCH) services did become more available during the Project period and coverage of the priority populations improved. Family planning (FP) use, particularly of less effective methods, increased and fertility declined although some change could have been expected even without the Project. Deaths due to neonatal tetanus were almost eliminated but mortality rates did not decline for a number of reasons, including the fact that services were probably not tailored closely enough to local health problems, especially respiratory diseases. The Project showed that it was possible to increase health and family planning services by using low-cost strategies (such as setting up community drug stores) and by employing paramedical workers, in this case, midwives. Preventive MCH-FP services were not overwhelmed by curative services as had been feared. Perhaps the most significant contributions of the Project were the lessons learned about delivering health and family planning services and conducting evaluation research. In general, if developing countries could maintain well-evaluated field laboratories for working out health and family planning delivery approaches before going nationwide, it is likely that time and money would be saved in the long run. (*Am J Public Health* 1983; 73:62–71.)

Introduction

The Bohol Maternal and Child Health-Based Family Planning Project was a five-year (1974–1979) project of the Philippine Ministry of Health. It operated within the public health system in the northwestern half of the island of Bohol, located 350 miles south of Manila. Four-fifths of the people were rural residents and almost all (97 per cent) were Catholic. By the end of the Project, the population of the Project Area was 425,000 and was increasing at about 1–2 per cent annually.

The Project became fully staffed in mid-1976. It stressed a maternal and child health (MCH) approach to family planning, and used paramedics, especially midwives, to reach families in remote areas. These midwives had two years of midwifery training beyond high school and were given four to six weeks of refresher training in primary health care and family planning by the Bohol Project. The Project's extension efforts included organizing, staffing, and equipping Primary Health Care Centers (PHCCs); setting up small drugstores; training traditional birth attendants and volunteer Barangay Health Workers; organizing an audiovisual team which recruited family planning acceptors in remote areas; training and equipping nurses and midwives to insert IUDs; and testing the acceptability of an injectable contraceptive in five municipalities.[1] The role of the Project staff was to advise the Provincial Health Office, assist with training, supervise special programs, and evaluate the results.

Evaluation was an important part of the Bohol Project. "Before" and "after" surveys measured changes in family planning knowledge, attitudes, and practice; MCH practices; morbidity; nutrition; and socioeconomic conditions. A dual record system, composed of a periodic household survey and a continuous special reporting network, operated for four years and covered 8,000 households in the Project Area.[2] This system provided data to estimate levels and trends in fertility, mortality, migration, and contraceptive use. Twenty small applied studies were done to improve health and family planning services. Over 80 research notes were published locally on topics ranging from abortion practices, birth weights, and breastfeeding trends to patterns of migration and age at marriage.[3]

Some comparisons can be made with the "non-project area," the southeastern half of the island, which had similar

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baseline economic and demographic conditions to the Project Area. Although such comparisons are interesting, strictly speaking, the non-project area cannot be considered a pure "control area." During the Project period, the health system in the non-project area also expanded. For example, the number of midwives in the non-project area increased at about the same pace as in the Project Area, through World Bank support.

The Bohol Project was one of four similar MCH-FP projects; the others were in Indonesia, Turkey and Nigeria.[4] External funding for the Bohol Project, above the normal public health budget, was $1.6 million. Over half the budget was spent on research activities. The annual per capita expenditure on externally funded health services was $.40 over the five-year period. Of the $620,000 spent directly on health and family planning services, expenditures were divided among personnel (40 per cent); drugs (10 per cent); vehicles and their maintenance and operation (9 per cent); renovation of buildings and rent (9 per cent); special demonstrations including the IUD program and vasectomy recruitment (7 per cent); training (4 per cent); medical supplies (3 per cent); staff travel (3 per cent); and other expenses (15 per cent). More information on costs and on the Project itself is contained in the final report.[3] The Project emphasized the thorough evaluation of low-cost preventive health strategies and family planning services which could be replicated elsewhere in the country. The design hypothesized that getting simple preventive health services to mothers and children would reduce mortality in these groups and that improvements in MCH would encourage FP use.

This paper gives a general overview of the Bohol Project and its results. The reader who wants more details is referred to the final report[3] and numerous published and unpublished papers.

Objectives of the Bohol Project

The original 1974 project proposal laid out the following objectives which helped guide Project activities:

Long Range

1. To improve maternal and child health and regulate fertility;
2. To determine and demonstrate effectiveness of a project in which family planning services are delivered through a well-organized maternal and child care program in a large, predominantly rural area.

Immediate

1. To develop and provide a better quality of health services for mothers and children;
2. To introduce and/or improve family planning services in the context of an expanded MCH program within the general health services;
3. To improve MCH-FP training and supervision of health personnel;
4. To undertake operational and other studies which will achieve the immediate objectives, including the determination of the types and amounts of program investments which give the best results, in the light of available resources.

These objectives were rather vague and make it difficult to say whether the Project was a "success." No explicit quantitative goals were set. One long-range goal was to "regulate fertility." As will be shown later, the birth rate did decline from 39 per 1,000 population to 34/1,000 during a four-year period (although the Project cannot take credit for all of this decrease). But the phrase "regulate fertility" could also include assisting infertile couples. The Project did not provide infertility services.

Nevertheless, it is possible to examine whether MCH coverage improved, whether family planning use increased and whether mortality declined in the Project Area. In the coming years, it will also be useful to assess the impact the Project has had on the Philippine national health and family planning program since it was intended to be a demonstration project.

Role of the Midwives

Each midwife provided health and family planning services to a population of 3,000 to 5,000. A sample of 48 midwives surveyed in 1978 estimated that they spent one-fourth (26 per cent) of their work time on family planning, 14 per cent on prenatal care, 20 per cent on delivery care, 15 per cent on postpartum care, 14 per cent on child care, and 11 per cent on general medical care (which included services for those other than mothers and children). The midwives also supervised the approximately 600 traditional birth attendants (TBAs), called "hilots" locally, and the 29 community volunteers (Barangay Health Workers) trained by the Project and the staff of the Rural Health Units (RHUs).

Midwives and Barangay Health Workers provided first aid and diagnosed and treated simple illnesses. Midwives sutured minor cuts; administered ergot injections for postpartum bleeding; gave BCG and DTP inoculations; gave tetanus toxoid to pregnant women; supervised oral rehydration; prescribed simple medicines and, on a limited scale, antibiotics; inserted IUDs and prescribed birth control pills; attended deliveries; weighed babies and gave nutritional advice; and made regular reports to the RHUs on their activities. Most deliveries in Bohol still occurred at home and many were attended by hilots, over 90 per cent of whom were trained by the end of the Project period. Midwives, hilots, and Barangay Health Workers brought basic health services to rural areas and were instructed to refer more difficult cases to the RHUs and hospitals. The rural-based midwives and hilots were supervised by the health team (made up of a physician, nurse and, rural sanitarian) of the nearest RHU which was typically located in the county seat (called locally, the "población"). The midwives and RHU staff were employed by the Provincial Health Office of the Ministry of Health.

Results

General Improvements

When the Bohol Project began, most of the 44 midwives working in the Project Area's public health system operated

out of the Rural Health Units (RHUs) located in the towns. By the end of the Project period, 127 midwives were practicing, mostly in remote areas. One hundred Primary Health Care Centers (PHCCs), each staffed by a midwife, had been set up and equipped. Toward the end of the Project, the Ministry of Health absorbed the new midwives, and they continue to work in the Project Area.

The Project provided the PHCCs with basic instruments, laboratory equipment, and instruments for IUD insertions. The hilots received delivery kits. The Project also attempted to provide appropriate transportation to health workers. Over 30 midwives were assigned horses while others received bicycles, motorcycles, or reimbursement for boat trips.

The Philippine Ministry of Health, like its counterparts in many developing countries, has found it difficult to supply the public health clinics in the towns with drugs. This problem was compounded in Bohol when 100 rural subcenters were set up. To alleviate this problem, the Project encouraged communities to set up small drugstores called "boticas sa barangay". These stocked basic medicines commonly prescribed by the midwives. By 1980, about 50 boticas had become self-supporting.

Since not all rural residents, particularly adult males and older people, came into contact with the midwives, an audio-visual team was organized to reach out to community groups with health and family planning information. It was composed of a driver, film projectionist, and a male and a female community organizer who showed films, gave talks, and recruited FP acceptors. Other media such as radio and written materials were not used extensively.

The Project increased the number of family planning methods available by training and equipping midwives to insert IUDs and, on a pilot basis, give injections of Depo-Provera. The PHCCs were stocked with oral contraceptives and condoms. The midwives and audio-visual team recruited sterilization acceptors and, in some cases, provided transportation to the RHUs and hospitals where the operations were performed.

When the Project was planned in the early 1970s, there was less concern among health professionals for community participation than there is in the early 1980s. Thus in the Bohol Project, efforts to involve the community evolved only gradually. The buildings for the PHCCs were donated and maintained by the community as were the non-medical furnishings. Local communities provided accommodations for the midwives and for visiting Project staff, and financed the community drugstores. Midwives gave community presentations and conducted Mothers' Classes.

Finally, there were general improvements in the area of evaluation. The Project conducted the complex research specified in the original design. Numerous papers were prepared and published locally and in professional journals. The Project's successes and failures in utilizing the research for local management are discussed elsewhere.[5]

Maternal Health Services

Service statistics, in comparison with census data, indicated that almost all (99 per cent) of the approximately 47,000 priority women living in the Project Area were identified by name by the midwives. Most (90 per cent) received at least one health service. Indications of improved maternal coverage appear in Table 1.

Table 1 suggests that the use of maternal health services did increase in the Project Area. Usually there was less change in the non-project area. In general, Boholano women were adopting modern health practices while retaining traditional ones.

Child Health Services

Approximately 67,000 priority children (i.e., those under age five) lived in the Project Area. These children accounted for 16 per cent of the population but over one-third of the deaths. Comparing census data with service statistics, it appeared that almost all (98 per cent) priority children were identified by name by the midwives, and most (89 per cent) received at least one health service during the Project period. Results on coverage appear in Table 1. Although the indicators are less plentiful for child health services than maternal health services and few comparisons can be made with the non-project area, there were clearly some improvements. The Project's emphasis on preventive health is also reflected in the monthly case loads: about 800 sick and 1,400 well infants (ages 0–1) were seen monthly as well as 1,400 sick and 2,500 well children (ages 1–4).

General Medical Services

Each month the midwives and RHUs gave services other than MCH and FP services to approximately 7,000 people, i.e., covering other than mothers and children. These services were mostly curative in nature and took up about 10 per cent of the midwives' time. Curative services did not overwhelm preventive services as some health professionals had predicted.

Family Planning Attitudes and Behavior

Approval of the idea of family planning was already widespread at the beginning of the Project, with approval greater among wives than husbands (according to the wives' reports). Even so, in both the Project and non-project areas, approval of family planning increased to over 80 per cent with more change reported for husbands although they still lagged behind their wives. Wives' approval of sterilization, the most controversial program method in Bohol, also increased (from 44 per cent to 62 per cent in the Project Area; 45 per cent to 57 per cent in the non-project area).

Between the 1976 and the 1978 surveys, women's ideal family size declined from 3.9 children to 3.7 in the Project Area and from 3.8 to 3.5 in the non-project area. In the Project Area, fewer women wanted additional children at the time of the second survey. Clearly some changes were occurring in family planning attitudes throughout the island province. Knowledge of family planning methods also increased.

Family planning methods became more available during the Project period through the Project and another local organization. There were more health facilities, counting both the Project's PHCCs and the Barangay Supply Points

TABLE 1—Maternal and Child Health Service Coverage, Bohol, Philippines

	Project Area		Non-Project Area	
	"Before" (1976)	"After" (1978)	"Before" (1976)	"After" (1978)
Mothers				
Per cent who said they consulted a health worker during pregnancy	68	85	58	67
Per cent consulting only a TBA during pregnancy	28	12	36	28
Per cent waiting until 3rd trimester to seek prenatal care	27	10	19	22
Mean number of health visits by pregnant women	3.4	3.8	3.4	3.4
Per cent receiving basic prenatal services during pregnancy[1]	10	30	6	13
Per cent of pregnant women getting two doses of tetanus toxoid	~40[2] (early 1977)	~60[2] (late 1979)	NA	NA
Per cent reporting a problem pregnancy who said they consulted a midwife	2	45	0	11
Per cent reporting that a bamboo sliver was used to cut umbilical cord at delivery of last live birth	18	6	23	21
Per cent receiving family planning advice during last pregnancy	61	68	64	77
Per cent of women getting postpartum care from midwife	~60 (early 1977)	~80 (late 1979)	NA	NA
Children				
Per cent (0–5 years) receiving BCG	58 (early 1977)	72 (late 1979)	NA	NA
Per cent (0–3 years) receiving two doses of DTP	48 (early 1977)	79 (late 1979)	NA	NA
Per cent of women breastfeeding their last live birth	93	94	93	94
Mean months of breastfeeding of last liveborn (for births occurring within 30 months prior to survey)	11.8	13.9	12.4	11.2
Percentage of infant deaths attended by a physician	3[3] (1970–1975)	37[3] (1976–1979)	18[3] (1970–1975)	34[3] (1976–1979)
Percentage of child deaths (1–5 years) attended by a physician	3[3] (1970–1975)	32[3] (1976–1979)	15[3] (1970–1975)	29[3] (1976–1979)

NA = Not available

~ = Approximate figure

[1]Basic services included examination of abdomen, urinalysis, blood pressure reading, tetanus toxoid injections, iron and vitamin supplements, advice on danger signals of pregnancy, and family planning counseling.

[2]Several municipalities did not administer tetanus toxiod because local health staff felt there was too little risk of tetanus neonatorum to justify the procedure.

[3]This information came from vital registration reports in ten municipalities, five in the Project Area and five in the Non-Project Area (V. Tallo, "Reported Causes of Death by Age: Bohol Project and Non-Project Areas, 1970–75 and 1976–69," Research Note 73, MCH-FP Project, Bohol, 1980). The Bohol Project was not physician-centered; hence this item might not appear to be a good indicator of the Project's impact. But midwives were instructed to refer cases beyond their capabilities to physicians and the increase in the number of midwives may have freed physicians for more serious cases. Thus we might expect that an indirect outcome of more midwives might be an increase in attendance at death by physicians. In the Philippines, a death is considered to have been medically attended if the deceased was attended by a physician during the illness or injury and the date of attendance is specified on the death certificate.

Note: The 1976 and 1978 surveys were approximately two and a half years apart. The 1976 survey covered 1,229 women in the childbearing ages of both Project and non-project areas. The respondents were a one-third sample of the population covered by the Project's dual record system. The response rate was 97 per cent. The 1978 survey interviewed 2,102 women residing in the same sample areas as in the 1976 survey, reinterviewing the same women from the 1976 who were still residing in the sample areas as well as women who had moved into the areas and age group between the surveys. In the 1978 survey, the response rate was 93 per cent.

TABLE 2.—Prevalence of Contraception: Percentage of Married Women (15–44) Using Family Planning in Bohol Household Surveys, 1975–1979

	Round 1 (Nov. 1975)		Round 4 (Dec. 1977)		Round 6 (May 1979)	
Family Planning Method	No.	%	No.	%	No.	%
1. Rhythm	523	10.5	851	15.7	952	17.7
2. IUD	86	1.7	112	2.1	197	3.7
3. Condom	63	1.3	117	2.2	136	2.5
4. Condom & rhythm	38	.8	143	2.7	123	2.3
5. Pills	210	4.2	139	2.6	99	1.8
6. Abstinence			243	4.5	427	7.9
7. Withdrawal			101	1.9	131	2.4
8. Female sterilization			81	1.5	120	2.2
9. Male sterilization	75	1.5	24	.4	38	.7
10. Depo-Provera			1	.0	34	.6
11. Other combinations			117	2.2	37	.7
12. Other methods			3	.1	5	.1
All methods	995	20.0	1932	35.9	2299	42.6
Program methods (1, 2, 3, 4, 5, 8, 9)	920	18.5	1468	27.3	1699	31.5
More effective methods (2, 5, 8, 9, 10)	296	6.0	357	6.6	488	9.1
Married women (15–44)	4969		5378		5391	

NOTE: To estimate the number of users in the total population, the above survey figures should be multiplied by nine since the household survey covered one ninth of the Project Area households. Six rounds of the household survey were conducted but to simplify the table, only rounds 1, 4 and 6 are included. The final report gives results for all six rounds. In rounds 1–3, interviewers were instructed to classify methods 6–12 as "other methods." This resulted in a loss of valuable information so in rounds, 4–6, separate categories were established for methods 6–11.

set up by a separate local development project called Project Compassion (or PROCOM), and more service providers (midwives and the full-time outreach workers and Barangay Supply Point Officers of PROCOM).

During the Project period, the percentage of Project Area couples practicing family planning increased. (Table 2) The baseline estimates were somewhat imprecise because the initial surveys did not thoroughly explore the use of abstinence, withdrawal, and combinations of non-clinical methods which were later realized to be popular. Furthermore, in early surveys, interviewers were instructed to classify non-clinical methods as "other methods". Keeping these caveats in mind, by 1979, 43 per cent of Project Area married women (ages 15–44) reported in the household survey that they were using family planning, compared with 20 per cent in 1975.

Although pills and condoms became much more available, their use did not increase dramatically. Instead, pill use declined steadily in Bohol (as well as nationwide) while condom use increased slightly. Rhythm was the most popular method in Bohol, accounting for two-fifths of Project Area users in 1979. IUD use declined early in the Project period but rose again after more midwives were trained to insert IUDs. Roughly one-half of the insertions took place at women's homes, a well-accepted innovation of the Project.

Overall, the use of highly effective methods (Table 2) increased only slightly: from 6 per cent to 9 per cent of married women ages 15–44. Without the Project, which actively recruited IUD and sterilization acceptors and introduced an injectable contraceptive on a limited basis, it appears likely the percentage of women using highly effective methods would have declined to 2–3 per cent. It is also worth noting that even though the Project actively supported pill use and made sure that all clinics had ample supplies, it did not reverse the downward trend. Concerns about side effects of the pill are widespread in the Philippines and probably accounted for the downturn in pill use both in Bohol and nationwide.

By the end of the Project, contraceptive prevalence rates in Bohol, a religiously conservative and economically underdeveloped province, were similar to national rates, although the method mix differed. Bohol women were less likely to use clinical methods (except for IUDs which were more popular in Bohol) and, in particular, favored rhythm more.

It would be easy (but simplistic) to attribute the popularity of rhythm in Bohol and nationwide to the direct influence of the Catholic Church. A more adequate explanation would probably begin with the observation that Philippine culture is highly pronatalist. This may be partially related to the Church's emphasis on the family but may also date back to before Spanish colonization. It appears that this pronatalism, whatever its source, makes many couples uncomfortable about limiting their fertility in the Philippines—it seems selfish not to welcome more children. But when couples achieve or exceed what they consider to be a manageable

family size, they begin to think about family limitation. Their choice of method appears to be influenced by negative publicity and misinformation about the safety and effectiveness of clinical methods. Some of this publicity may come from Church sources, directly or indirectly, but the popular press is also involved. Whereas childbirth and its hazards are considered natural and understandable, the rumored or experienced side effects of clinical methods are frightening and incline both service providers and users toward the method widely reported to have "no side effects"—rhythm.

In a setting like Bohol, a program in cooperation with the Church which attempted to increase the knowledge and effectiveness of rhythm use, for couples preferring this method, might be of considerable value. National research[6] suggests that only one-fourth (23%) of Filipino wives in the childbearing ages can correctly identify the most fertile period of the menstrual cycle. Hence, there is considerable room for improvements in knowledge.

Within Bohol, the Project and non-project areas showed basically similar family planning patterns. In late 1978, the Project Area had slightly higher prevalence rates: two to four percentage points higher, depending upon the types of methods included.[3] During the Project period, pill use declined more in the non-project area. IUD use increased in the Project Area and decreased in the non-project area. Sterilization also increased more in the Project Area. It appeared that efforts to promote the IUD and sterilization had some effect in the Project Area and about 850 Project Area women tried a three-month injectable which was introduced on a trial basis.

Throughout Bohol, the characteristics of acceptors changed over the period 1975–1978. More recent acceptors were younger, of lower parity, less educated, and from more rural backgrounds. This suggests the success of rural extension efforts in Bohol. But a consequence of this success was that these new acceptors, possibly because they were more traditional or less motivated, disfavored clinical methods and had lower continuation rates for methods they did choose. The MCH approach, with its closer follow-up of eligible women, was expected to have *improved* continuation.

The family planning contribution of PROCOM, a development program in Bohol with a family planning component, appears to have been limited according to a survey conducted 18 months after PROCOM staff were in the field. Few Project Area women surveyed reported that they were aware of PROCOM's staff providing family planning services. PROCOM's family planning efforts, a minor part of the organization's activities, centered mainly on encouraging pill and condom use. As noted above, pill use declined during this period and condoms use increased only slightly.

It is difficult to measure precisely the Project's contribution to family planning in the Project Area except in its success with recruiting acceptors to the IUD, sterilization, and Depo-Provera. However, some of these acceptors might have used other methods, had the Project not been there. Trends such as changes in the characteristics of acceptors, the unpopularity of pills, and the appeal of non-clinical methods occurred throughout Bohol and the rest of the country.

Relationship between MCH and Family Planning

The Project was intended to demonstrate that an MCH program could be an effective vehicle for family planning in a rural area as well as bringing its own benefits to mothers and children. The Project, a successor to The Population Council's hospital-based postpartum program,[7] focused on providing family planning to recent mothers, on the assumption that these women would be especially motivated to practice family planning. It was thought that women who had received maternity services from a midwife would be more likely to trust her advice on family planning. During the Project period, an increasing proportion of mothers and children received health services while, at the same time, family planning use increased. Was there any connection between the two?

In the case of IUD insertions and Depo-Provera injections, there was a direct connection since these services were provided mainly by the midwives. Research results also suggest a more general connection. Project Area women who were part of a 1978 survey and who had a birth in the 30 months prior to the survey were more likely to have practiced family planning if they received services from a midwife (Table 3). The percentages of all women having live births in the 30 months previous to the surveys who used family planning tended to be high, however. The consistent (although not dramatic) pattern of higher family planning use for those getting MCH services held only in the Project Area in 1978—not before the Project was in place and not for the non-project area.

In our experience, the mere existence of midwives giving MCH services was insufficient to increase contraceptive use. Midwives must have strong family planning orientation and training, proper equipment, and clear instructions that family planning is an important part of their job. The Bohol experience suggests that an MCH approach can encourage family planning use. However, the design of the experiment was not such that we can compare the MCH approach with other approaches.

Demographic Impact

The vital registration system in Bohol was incomplete. Hence, the Project used a dual record system* to measure demographic trends between 1975–1979. The system covered a one-ninth sample of the Project Area population.

Fertility

Fertility had been declining in Bohol, and nationally, before the Project, according to surveys. During the Project period (1975 and 1979), the total fertility rate in the Project

*The Bohol dual record system used a periodic household survey (every six months at the beginning, and every 12 months later on) and a continuous reporting system in which ten special reporters sought information on birth and death events in the 63 sample areas from informants. Events were then matched at the central office. Nonreported events were estimated by the Chandrasekhar-Deming formula.[2]

TABLE 3—Proportion of Women Practicing Family Planning (after last live birth) by Use of Maternity Services

	Project Area				Non-Project Area			
	"Before" (1976)		"After" (1978)		"Before" (1976)		"After" (1978)	
	%	N	%	N	%	N	%	N
Received prenatal services from a midwife?								
Yes	77	98	89	188	82	74	77	146
No	89	35	81	32	62	39	82	61
Received FP counseling from a midwife?								
Yes	79	96	89	180	78	77	76	140
No	90	10	68	19	75	8	83	30
Delivered by a midwife?								
Yes	82	44	92	67	76	29	72	62
No	79	91	86	153	76	87	81	145

Source: Surveys conducted by the Bohol Project and described in note to Table 1. Included in the table are only those women having a live birth in the 30-month period before each survey.

Area declined from 6.3 to 5.4 (Table 4). Some of this decline occurred before the Project was fully staffed and could be expected to affect fertility, given a nine months' delay. As for the remaining decline, we can eliminate several competing causes of fertility decline. The decline occurred in spite of the fact that there were more women in the childbearing ages and slightly more married women. It was also unlikely to be due to increased abortion. It was probably not related to improved living conditions which apparently stagnated during this period, according to the "before" and "after" surveys. It was also unlikely to be due to PROCOM's family planning efforts or to commercial or private sources of family planning which were insignificant in Bohol.

The fact that the biggest decline was in marital fertility suggests that family planning use was responsible as an immediate cause. As shown earlier, use of family planning did increase, especially for non-clinical methods. Research at the national level has shown that even non-clinical methods like rhythm reduce pregnancy rates significantly.[8]

But this does not resolve the issue of the contribution of the Bohol Project to the observed fertility decline. One approach is to examine the fertility trend in the non-project area. The non-project area had a similar increase in health personnel but those new staff did not appear to have as much interest in, or logistical support for, family planning. Since the dual record system (which produced the data in Tables 2 and 4) operated only in the Project Area, we must rely on "before" and "after" surveys to compare fertility in the two halves of the province. Retrospective surveys found a 15 per cent decline in general fertility in the Project Area from

TABLE 4—Fertility and Mortality Trends: Bohol Project Area, 1975–1979

	April–Sept. 1975	Oct. 75–Mar. 76	April–Sept. 1976	Oct. 76–Sept. 77	Oct. 77–Sept. 78	Oct. 78–Mar. 79	Per Cent Decline 1975–1979
Fertility							
Crude birth rate (per 1000 population)	38.7	36.7	35.2	36.2	35.1	33.5	13%
Total fertility rate	6.3	6.0	5.8	5.8	5.6	5.4	14%
Total marital fertility rate	12.5	10.9	10.0	10.8	10.8	9.5	24%
General fertility rate (per 1000 women 15–49)	181	173	166	166	160	153	15%
Mortality							
Crude death rate (per 1000 population)	[8.5]	10.3	10.2	10.4	9.8	9.9	
Child (1–4) death rate (per 1000 population)	[4.9]	6.3	7.5	8.7	8.7	8.0	
Infant mortality rate (per 1000 live births)	[66.5]	63.3	70.7	70.0	74.7	59.0	

[ ] = underestimate
Source: Bohol dual record system

1970–1974 to 1975–1978, compared with a 9 per cent decline in the non-project area. National birth rates also declined during the Project period, from 36.3 in 1975 to 33.5 in 1979, a decline of 8 per cent.[9] Hence, although any decline in the Project Area must be put in the context of declines elsewhere in the country, the decline appears to have been somewhat greater in the Project Area.

In the Project Area, fertility declined the most on the offshore islands which had had extraordinarily high fertility in the first four rounds of the dual record system. From crude birth rates of well above 50, the rate declined to 43 and finally 38. The Project gave special attention to offshore islands which had unusually poor living conditions and assigned them more midwives than their population sizes merited.

Mortality

Ignoring an implausibly low initial dual record system estimate, the crude death rate (CDR) in the Project Area (1976–1979) ranged from 9.8 to 10.4 and averaged 10, with no downward trend (Table 4). The national average during this period was also 10. (If Bohol had the national age distribution, its CDR would have been 9.) Although Project staff had hoped that general mortality would decline, this was probably unlikely given the Project's concentration on only a segment of the population: mothers, children, and infants. Thus we must turn to mortality of these specific groups.

Given the rarity of maternal deaths, the sample dual record system which normally provided the best information on demographic trends could not accurately measure maternal mortality. The vital registration system, which probably missed a few events, found 20 maternal deaths in 1977, 23 in 1978, and 20 in 1979 (per approximately 14,000 annual live births), with no downward trend.

The 1–4 year old death rate (Table 4) ranged from 6 to 9 and averaged 8, with no downward trend. But these rates involved few events—161 child deaths in all.

The infant mortality rate (IMR) varied seasonally during the Project period and averaged about 70 with no downward trend. Again, the rates involved small numbers of events—418 infant deaths in all. The Bohol IMRs were similar to those found nationally for the same period (68 to 75 per 1,000 live births).

Infant deaths due to one cause, neonatal tetanus, clearly declined during the Project period from about 25 per year at the beginning of the Project to 3–4 per year at the end. The decline was likely due to Project efforts in training traditional birth attendants and administering tetanus toxoid to pregnant women. However, because deaths due to neonatal tetanus were quite rare, their elimination had no overall demographic impact.

Given the problems of sampling error for the dual record system estimates and the varying (and incomplete) coverage of the vital registration system, we cannot be absolutely certain about trends in infant, child, and maternal mortality during the Project period although we can say that general mortality did not decline.

There are a number of plausible explanations for the lack of a dramatic mortality decline. These are discussed elsewhere.[10] Perhaps the most plausible is that the Project's health services were not closely enough tailored to the major causes of death and that resources were insufficient to provide comprehensive primary health care (including improved water, nutrition, sanitation). The admittedly imperfect vital registration data on causes of death indicated that the major reported causes of infant deaths in the Project Area between 1970–1979 were bronchopneumonia, cardiorespiratory failure, prematurity, pneumonia, fever, and bronchitis. Comparable causes of death to 1–4 year olds were bronchopneumonia, pneumonia, gastroenteritis, and bronchitis. Respiratory diseases were clearly the major causes of mortality and morbidity in the Project Area and, in future programs, should receive more attention. But better cause of death information is also needed.

Discussion

The Project had several advantages which allowed it to show progress in MCH and FP services. Before it began, a base of political support, both local and national, had been established. After it got started, it had local autonomy in day-to-day management. Budgets to the United Nations Fund for Population Activities were prepared annually and this provided flexibility. For example, after the midwives' salaries were taken over by the Ministry of Health, money could be requested for new activities. The Project's national Steering Committee actively participated in guiding the Project and provided an important connection with national policy making.

Within the Project, managers were willing to innovate and learn. Timely and relevant information was frequently available for management decisions.[5] There was a continuing concern with logistical problems. Out of this came the boticas, home IUD insertions, the audio-visual team, experiments with transportation, and the small Barangay Health Worker program.

The Project had ample technical assistance. The World Health Organization procured vehicles, drugs, and other equipment; provided a technical advisor; and assisted with medical and financial matters. The Population Council prepared drafts of the project proposal; gained early support for the Project; designed some of the research; provided evaluation advisors and consultants; obtained research materials; publicized the findings; and coordinated the international program.

In retrospect, the Project may have been overly ambitious, attempting to improve health and reduce fertility in a fairly short time, solely by means of a low per capita cost preventive MCH-FP program, in a large rural population under difficult logistical conditions. Yet because the majority of people in developing countries live in similar or even more inaccessible settings, the test was a realistic one.

The Project experienced difficulty maintaining political support in Manila in the face of turnover among top officials in the national health and population programs. Within the Project, evaluators and managers had some initial conflict

and lack of coordination. But this problem was satisfactorily resolved midway through the Project.

Among the Project's successes should be counted the Project's ability to disperse the midwives to rural areas; to get them to reach with at least one service, most of the target populations; the experiments with transportation, community drugstores, and the audio-visual team; the provision of services to the remote islands; the IUD program using midwives and home services; the decline in deaths due to neonatal tetanus; the increase in family planning use; some of the decline in fertility; and the quantity and quality of the evaluation research conducted.

Among the disappointments were the inability of the Project to popularize oral contraceptives; the very modest increase in use of the more effective methods; the higher discontinuation rates; the lack of an impact on mortality (aside from neonatal tetanus); the inability to collect good morbidity and cause of death information; and the lack of attention to respiratory diseases. It is probably too early to assess its impact on long-term national health and family planning policies.

Lessons Learned

General

- Rural health and family planning programs must still devote considerable attention to logistical problems such as providing adequate supplies of basic, low-cost drugs, transportation, and equipment.
- Expensive buildings are not necessary for the delivery of health care in rural areas. Money is better spent on staff, training, logistical support, equipment, transportation, community organization, and educational efforts.
- Community-run boticas appear to be an inexpensive way of getting basic drugs to rural areas. Ideally, a small number of basic drugs should be prepared locally, distributed, and then prescribed by generic name. The Bohol Project found that generic drugs had to be attractively packaged or people assumed they were inferior products.
- Horses can be inexpensive and practical for midwives traveling in hilly areas, while bicycles are appropriate for flat areas. In Bohol, motorcycles proved to be too expensive to purchase, maintain, and run.
- Having an evaluation unit within a project can improve its management if the research is jointly planned by managers and researchers and if the two groups cooperate throughout the evaluation process.
- Health services need to be tailored closely to the major causes of death and illness with consideration also given to cost and feasibility of control of local diseases. In Bohol, more attention should have been given to research on local causes of death and to the treatment of respiratory diseases.
- Health and family planning programs should select a few service statistics indicators of program performance and then try to increase their accuracy. Otherwise, too many forms are required for health workers to fill out and, as a result, all the data suffer. If resources permit, evaluations should rely initially on surveys and use these to assess the coverage of service statistics and vital registration systems.

Family Planning

- MCH/FP programs should give more attention to men. A 1979 survey in Bohol found that 80 per cent of couples in Bohol were using FP methods requiring the active participation of men (rhythm, withdrawal, abstinence, condoms, vasectomy, or combinations of these methods). More male motivators should be employed or men in other jobs (such as rural sanitarians) should be trained in family planning and encouraged to counsel men and distribute educational materials directed at men. We also found that men were involved in health decisions and health care. They should not be ignored by either health or family planning programs.
- Paramedical staff (in Bohol, midwives) can safely insert IUDs, give injections, and prescribe oral contraceptives. Midwives in the Philippines are close to the rural population, are in ample supply and, being female, are preferred by female clients for procedures like IUD insertions.
- The popularity of the IUD can be increased if the method is widely available, even at a client's home, from a female health worker.
- Depo-Provera is a highly effective method of family planning. In Bohol, it was suitable and acceptable to some women but providers, clients, and hospital staff needed reassurance about its safety and information on possible effects on bleeding patterns.
- An audio-visual team can be an effective way of reaching rural populations, especially those not seen by a midwife such as men or older people. The team must be highly motivated, well trained, and adequately equipped, since the work is taxing.
- More clients will avail themselve of sterilization if, after they have made a decision to have sterilization, they are followed up and given transportation to a service point.
- In a setting like Bohol, training in traditional methods like rhythm should be improved, possibly in cooperation with the Church. Midwives should routinely educate women about their menstrual cycles and the "safe" period. In addition, methods which are female-controlled and without systemic side effects, such as the diaphragm or suppositories, might be tested locally.
- Health staff need continuing education in family planning and specific guidance on how to present methods in a positive way. Health and family planning programs need to be more assertive in counteracting incomplete information whether it is disseminated by villagers, priests, neighbors, politicians, or traditional practitioners.

Research

- Managers need research training while researchers should be thoroughly familiar with the operations and goals of the action project being evaluated.
- "Before" and "after" studies can provide considerable information but the results may come too late to be useful and not allow for mid-term corrections in services. In

the Bohol Project, data from the "before" and "after" studies were computer-processed in Manila. Many reports came out only at the end of the Project. In contrast, the smaller applied studies were usually completed in several months. On balance, simpler, more frequent, jointly planned, and hand-tabulated studies may be more useful to project managers.

- A dual record system, although complex and relatively expensive, can be very useful in providing periodic information on fertility, mortality, and contraceptive use in an action project. In Bohol, hand-tabulation of dual record system data provided prompt results. The household survey component performed better than the special reporting system. In future projects, a multi-round, multi-purpose survey might be preferable to the complex dual record system and the "before" and "after" surveys.

Conclusion

Given the urgency of health and population problems in developing countries, the political considerations, and the pressures from funding agencies, countries are tempted to implement new programs nationwide before testing them for practicality and effectiveness in typical rural areas. However, careful field testing of new delivery approaches expected to be of future relevance nationwide would likely save time and money in the long run.

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