

Reprinted from: Voluntary sterilization: a decade of achievement. Proceedings of the 4th International Conference on Voluntary Sterilization, Seoul, Korea May 7-10, 1979, Marilyn E. Schima & Ira Lubell (eds). (New York, Association for Voluntary Sterilization, 1980), pp. 197-205.

Promotion of Postpartum Contraception Using MCM as a Tool of Management

Roger P. Bernard, Ellen M. Kendall, and Malcolm Potts

INTRODUCTION

More and more obstetricians in both developing and developed countries want early and routine access to a comprehensive profile of the women who deliver at their institutions. Routine monitoring can help health professionals and administrators identify unmet needs so they can set priorities for the use of available but, all too often, limited resources.

Areas to be singled out for routine study and programmatic intervention include: (a) reproductive history in the context of the socio-economic status, (b) the general health status of the mother, (c) management of the current delivery including antenatal and postnatal care, (d) outcome of the current delivery, that is, the postpartum status of the mother and infant, including their well-being, morbidity and mortality, and (e) the woman's postpartum intentions to family planning and *the institution's response to those intentions*.

A core package of information may be collected with a standardized maternity record form that then becomes part of the woman's clinical record. The International Federation of Gynaecology and Obstetrics (FIGO) has introduced an experimental version of such a maternity record in collaboration with the International Fertility Research Program (IFRP), and to date more than 100 maternity centers around the world have participated in an expanded pre-test of this single sheet record. Earlier reviews ascertained the feasibility and immediate usefulness of Maternity Care Monitoring (MCM) for continuing evaluation at the maternity ward level (1,2,3).

It should be emphasized that institutionally based data will not necessarily reflect the overall situation in the country, but institutional trends can be analyzed, unmet needs defined, and cross-cultural comparisons established.

The maternity record records data collected while the woman is in the hospital for delivery. Follow-up is not possible. In this paper the woman's *intention* to use contraception is recorded, although it is not possible to check if this *intention* was fulfilled in all cases. Some women desiring sterilization obtained the operation postpartum in the hospital while others merely stated their intention to be sterilized.

This report focuses on a small but important part of data routinely collected at the maternity ward. Postpartum contraceptive intentions in context of family size expectations and surgical contraception provided before discharge is compared with the women's declared intentions to seek voluntary sterilization. The analysis concentrates on Asian studies.

MATERIALS AND METHODS

Institutional MCM establishes a *continuous survey at birth* for every woman who delivers, whether at a large metropolitan or teaching hospital or at a more peripheral maternity center. The single sheet, double-ply maternity record inquires into the five themes cited in paragraph two (a-e) and the data collected may be analyzed on a national or international level. An instruction manual facilitates proper completion of each record to be added to both the patient history and a central data bank. A set of preprogrammed computer-generated tables permits easy and rapid access to information on service and health/fertility status. The *feedback to the institution* is a critical step in improving reproductive care and behavior. *Interinstitutional feedback* gives additional insights (4).

The 15 MCM studies conducted in Asian departments of obstetrics and gynecology during the pretest period (1977/1978) cover a broad geographic zone from Japan to Pakistan. To achieve regional perspective, the 15 data sets were split into two groups: (a) *East Asia* (Japan, Singapore, Thailand and Indonesia) and (b) *Indian Subcontinent* (Bangladesh, Sri Lanka, India and Pakistan).

Two additional studies were included to provide a broader epidemiologic perspective: a center in Ibadan (Nigeria) was added to the East Asian group and a center in Tehran (Iran) was added to the Indian subcontinent group.

Data on 59,386 women in maternity centers are presented. Reproductive attainment and desire (Figures 1-4) is assessed for the various maternity centers. The group of women who say they want no more children is then split into the two extremes in planned protection: non-protection and voluntary sterilization (Figures 5 and 6). Further specificity is then reached by looking at women with three living children postpartum and their desire for

additional children. This group is then subdivided in the same way: those intending sterilization and those choosing no protection (Figures 7-10).

This systematic approach by regional centers, proceeding from reproductive attainment and desire to contraceptive intentions and protection, points up valuable information on *unmet needs* for family planning services.

FINDINGS

Fertility Attainment

As expected, the profile of fertility attainment varies greatly from center to center. The mean number of living children postpartum ranges from 3.6 (center in Karachi)

down to 1.5 (center in Tokyo). Four centers on the Indian subcontinent show a narrow range (2.1 - 2.2) while the two centers in Bangladesh have means of 2.4 and 2.8 living children postpartum. The mean number of living children postpartum in four Indonesian studies show a range from 2.8 (Semarang and Bandung) to 3.3 (Medan).

Fertility Expectations and Fertility Attainment (Figures 1 and 2)

Systematic postpartum inquiry into the number of additional children wanted is used as the basis for aggregate institutional estimates of total family size expectations. The bivariate representation of current fertility attainment and additional children desired for various centers produces informative scattergrams (Figures 1 and 2). The

Figure 1. Mean Number of Additional Children Desired Versus Mean Number of Living Children Postpartum.

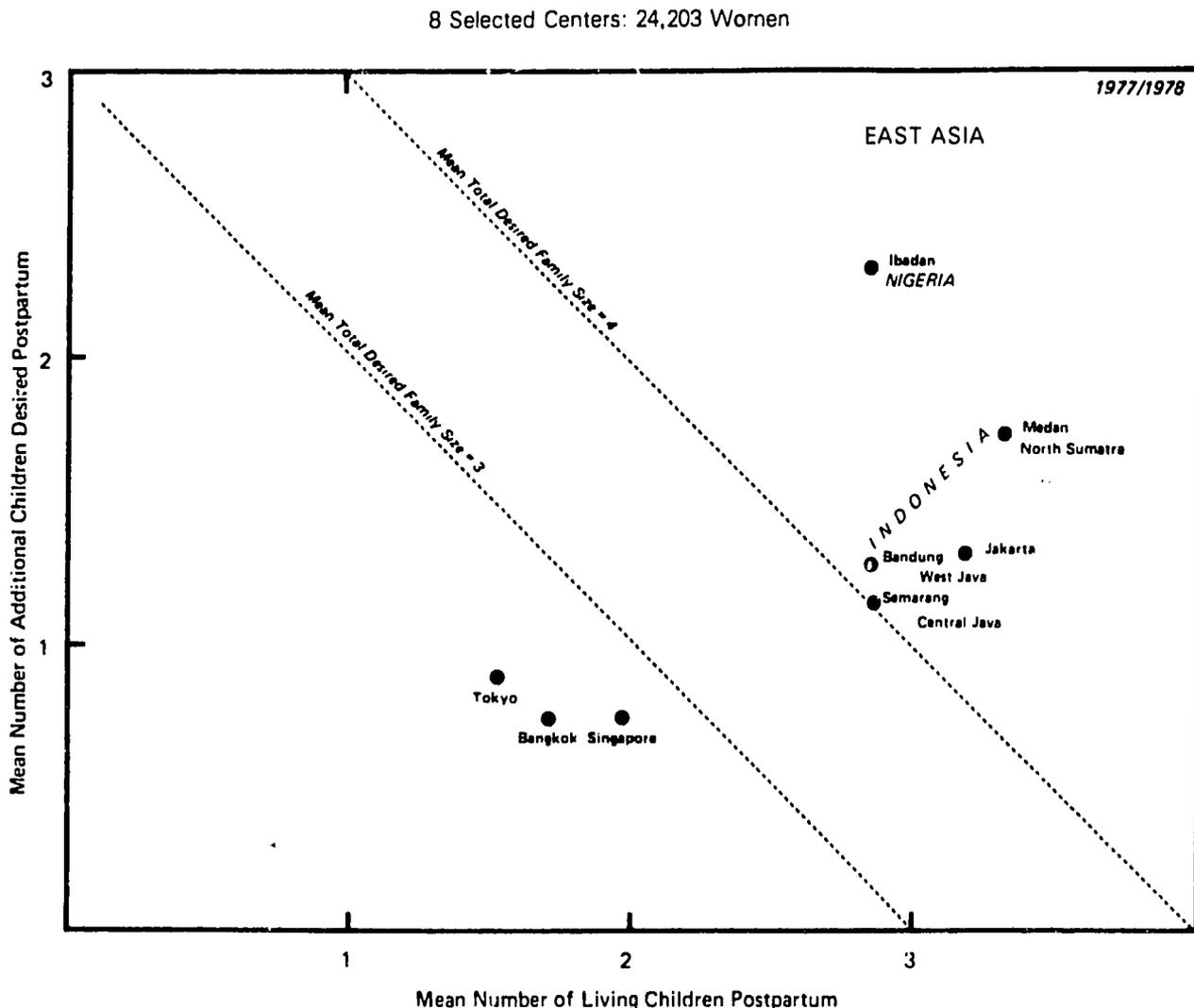
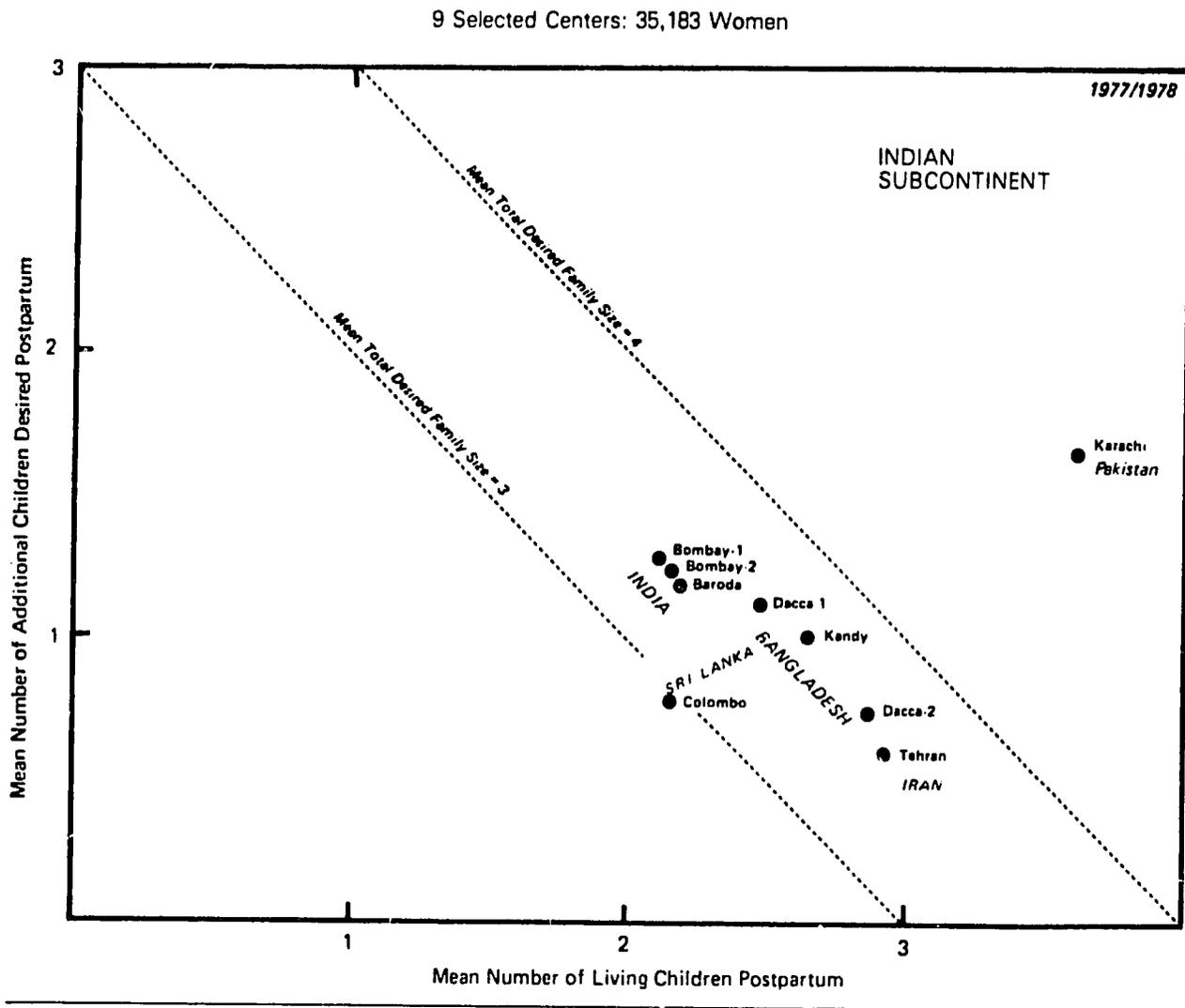


Figure 2. Mean Number of Additional Children Desired Versus Mean Number of Living Children Postpartum.



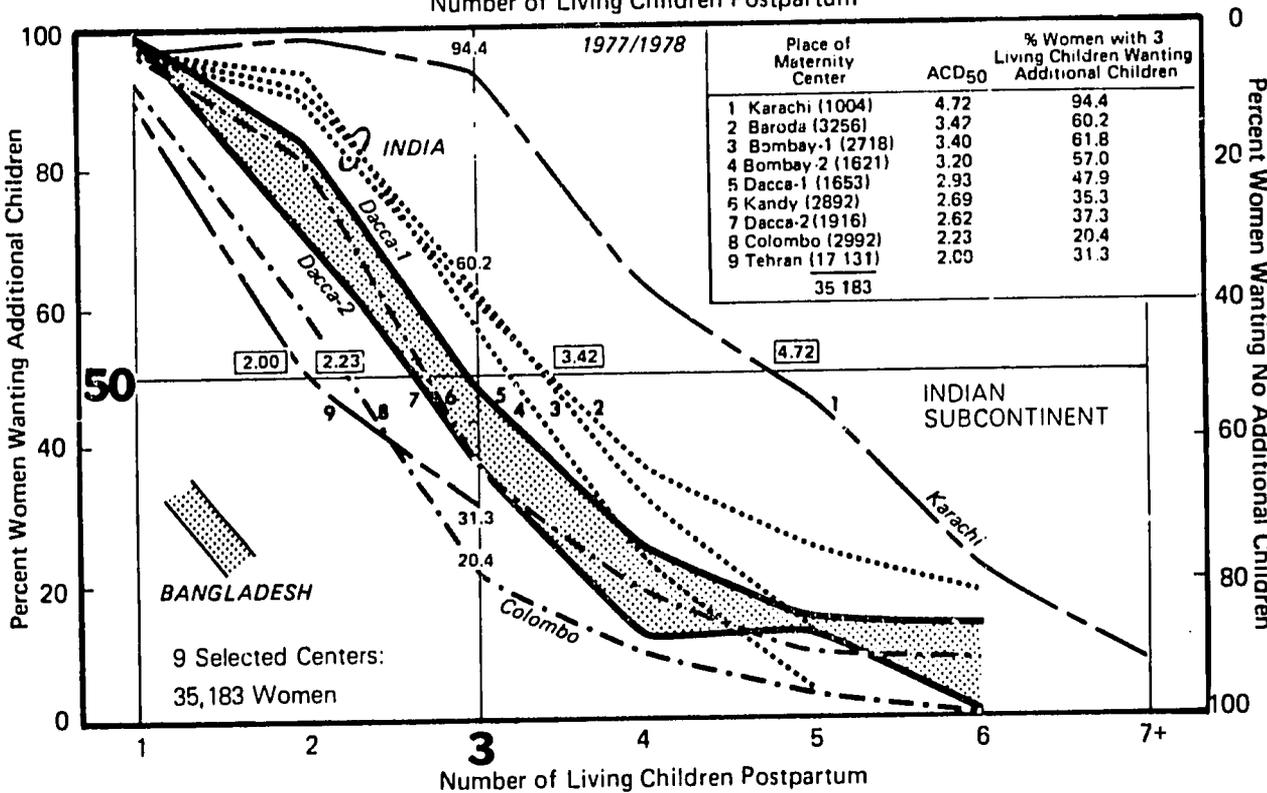
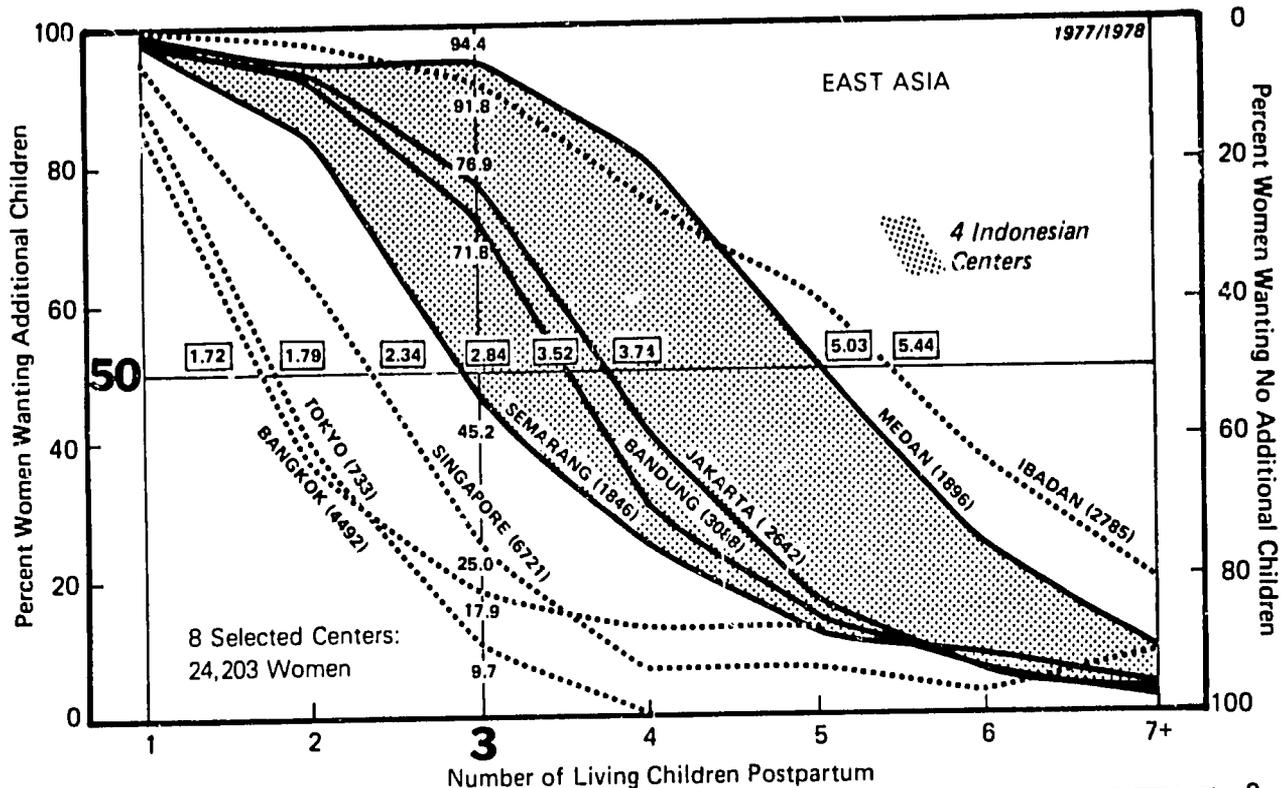
centers in Tokyo, Bangkok and Singapore have mean family size desire estimates of less than three children, while the four Indonesian centers have values of more than four children. One center in Indonesia (Medan), one in Nigeria (Ibadan) and one in Pakistan (Karachi) have values of more than five children.

Fertility Expectations by Fertility Attainment (Figures 3 and 4)

Institutions can measure additional fertility desire for each level of fertility attainment. The proportion of women wanting additional children postpartum by number of living children postpartum can be summarized particularly clearly by two indices. The first index is the proportion of women with three living children postpartum who want additional children. As shown in Figures 3 and

4, the percentages of women in the 17 centers who want more children range from 94.4% (Medan and Karachi) to only 9.7% (Tokyo). Most women with three living children postpartum in the centers in Medan, Ibadan and Karachi want additional children, whereas in the maternity centers in Tokyo, Bangkok, Colombo and Singapore, most women do not want additional children. The second index is the interpolated number of living children postpartum at which 50% of the women do want and 50% do not want additional children. This midpoint is similar to the concept of the LD_{50} in toxicology—the point at which 50% of animals die when given poison. When the term is modified for use in the epidemiology of reproductive care, it is referred to as “Additional Children Desired-Fifty” (ACD_{50}). For the data sets from the 17 centers, the ACD_{50} spans a wide range from 5.44 living

Figures 3 & 4. Percent of Women Wanting Additional Children by Number of Living Children Postpartum and Additional Child Desire-Fifty (ACD₅₀), the Interpolated Number of Living Children at Which 50% Want and 50% Do Not Want Additional Children



4

children (center in Ibadan) to 1.72 living children (center in Bangkok) as shown in Table 1. The centers in Ibadan, Medan and Karachi exhibit the highest midpoints (more than 4.5 living children) and the centers in Bangkok, Tokyo, Singapore, Colombo and Tehran the lowest (less than 2.5 living children).

The grey areas in Figures 3 and 4 delineate ranges within Indonesia and Bangladesh, respectively. The four maternity centers in Indonesia reflect a West-East decrease in fertility desire (Medan-Semarang), which is in line with the known gradient of national family planning penetration (5). The two centers in Dacca, the capital of Bangladesh, also show a measurable difference in fertility expectations, although they are located only some kilometers apart. The women at the center with the poorer population (Dacca-2) want fewer children.

Contraceptive Intention and Contraceptive Service Postpartum (Figures 5 - 10)

Women who do not want additional children are the highest priority for early intervention postpartum (Figures 5 and 6), and they are most likely to accept the sterilization of either partner.

Figures 5 and 6 give the two extremes of intended/obtained contraceptive protection for all the women who declared postpartum that they did not want additional offspring. The percentage of women who say they want

no more children but do not intend to use contraception varies from less than 3% in the centers in Tehran, Medan, Bangkok and Singapore to more than 15% in the centers in Bombay-1, Colombo, Tokyo and Kandy.

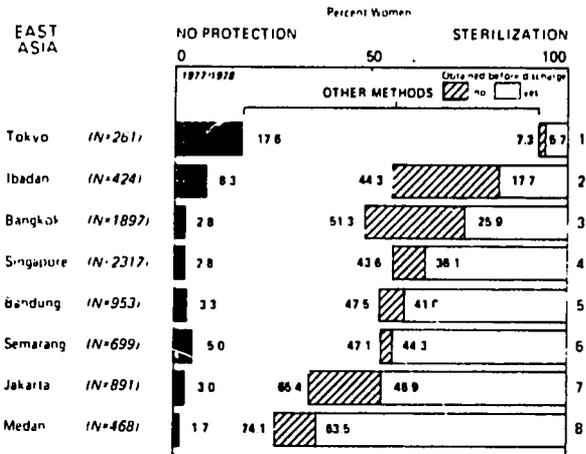
The rate of intended voluntary sterilization varies even more, from less than 10% (Tokyo) to more than 60% (Medan, Karachi, Bombay-2, Bombay-1, Jakarta, Kandy and Baroda), which may reflect essential differences in information and education for choosing surgical contraception. Furthermore, the availability of surgical services postpartum seems to vary greatly just as the actual num-

Figures 5 & 6. Rate of Non-Protection (Left) and Postpartum Sterilization Before Discharge (Right) Among Women Who Reported That They Did Not Want Additional Children. Ranked in Ascending Order of Predischarge Sterilization Rate.

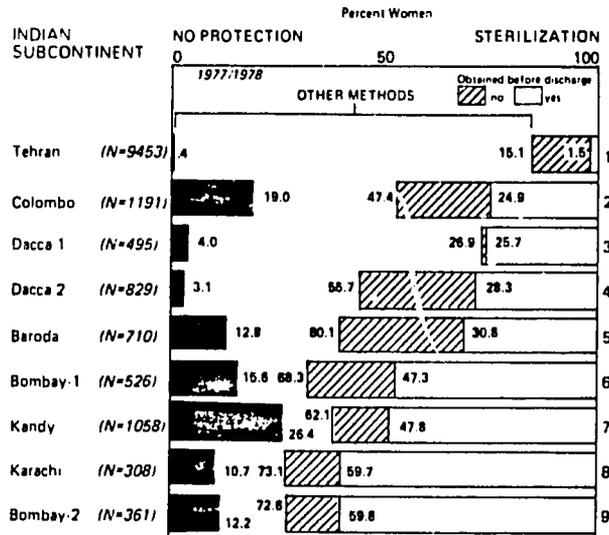
Table 1. Additional Children Desired-Fifty (ACD₅₀) Is Ranked in Descending Order.

Order	Center	ACD ₅₀	% Women with 3 living children wanting additional children
1	Ibadan	5.44	91.8
2	Medan	5.03	94.4
3	Karachi	4.72	94.4
4	Jakarta	3.74	76.9
5	Bandung	3.52	71.8
6	Baroda	3.42	60.2
7	Bombay-1	3.40	61.8
8	Bombay-2	3.20	57.0
9	Dacca-1	2.93	47.9
10	Semarang	2.84	45.2
11	Kandy	2.69	35.3
12	Dacca-2	2.62	37.3
13	Singapore	2.34	25.0
14	Colombo	2.23	20.4
15	Tehran	2.00	31.3
16	Tokyo	1.79	9.7
17	Bangkok	1.72	17.9

8 Selected Centers: 7,910 Women



9 Selected Centers: 14,931 Women



5

ber of women obtaining surgical service before hospital discharge shows great variation when compared with the woman's stated intentions. An index of institutional sterilization service varies from .955 (Dacca-1) down to .099 (Tehran) as shown in Table 2. In the maternity hospital in Tehran, the problem may be one of availability of services during the few hours the women remain at the hospital postpartum.

When the analysis is restricted to women with three living children postpartum, the variation in contraceptive intention is even greater (Figures 7 and 8). The rate of intended nonprotection ranges from less than 1% (Tehran, Medan, Bangkok and Singapore) to more than 30% (Kandy and Karachi).

The rates of intended sterilization of either partner range from 6% (Tehran) to more than 70% (Bombay-1, Bombay-2, Baroda and Bangkok). Probably most couples with three living children postpartum in all Indian studies elect voluntary sterilization because of systematic postpartum motivation at the maternity center. But there is a great variation in intended male sterilization as declared by the women. Table 3 shows that, in four centers, between 10% and 20% of all intended sterilizations are planned for the male partner (Bandung, Bangkok, Baroda and Dacca-2), as compared with the total absence of intended male sterilization in seven other centers (Tehran, Tokyo, Karachi, Dacca-1, Ibadan, Jakarta and Medan). The great difference by center in Indonesia is

noteworthy. In the centers in Jakarta and Medan there are no planned male sterilizations, whereas 19.2% of all planned sterilizations in the center in Bandung are vasectomies. A similar variation occurs between the two Dacca centers, with 10.4% vasectomies planned in one center and none in the other.

In various centers an "all-or-none" protection pattern emerges among women with three living children postpartum, with a marked shift toward (planned) sterilization when Tehran (6.0%) is compared to Bangkok (88.3%). Indeed, the rate of intended nonprotection for

Figures 7 & 8. Rates of Non-Protection (Left) and Intended Postpartum Sterilization of Either Partner (Right) for Women with Three Living Children Postpartum Who Do Not Want Additional Children.

Table 2. Women Wanting No More Additional Children. An Index of Surgical Contraceptive Service Postpartum is Ranked in Descending Order.

Order	Center	% intending sterilization (a)	% sterilized before discharge (b)	Surgical service index (b/a)
1	Dacca-1	26.9	25.7	.955
2	Semarang	47.1	44.3	.941
3	Bandung	47.5	41.0	.863
4	Medan	74.1	63.5	.857
5	Singapore	43.6	36.1	.828
6	Bombay-2	72.6	59.8	.824
7	Karachi	73.1	59.7	.817
8	Tokyo	7.3	5.7	.781
9	Kandy	62.1	47.8	.770
10	Jakarta	65.4	46.9	.717
11	Bombay-1	68.3	47.3	.693
12	Colombo	47.4	24.9	.525
13	Baroda	60.1	30.8	.512
14	Dacca-2	55.7	28.3	.508
15	Bangkok	51.3	25.9	.505
16	Ibadan	44.3	17.7	.400
17	Tehran	15.1	1.5	.099

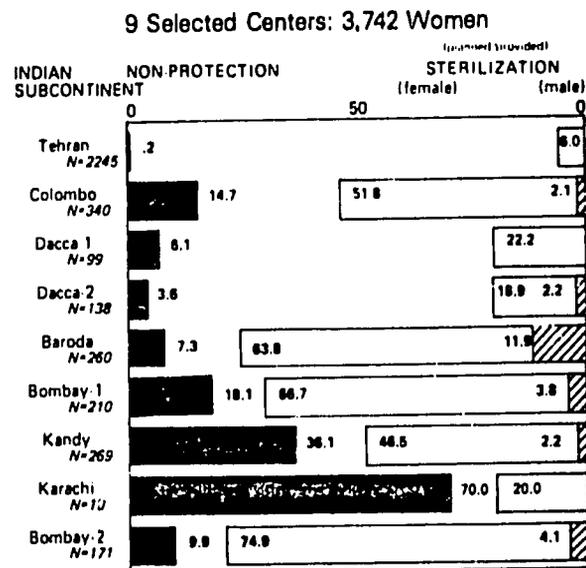
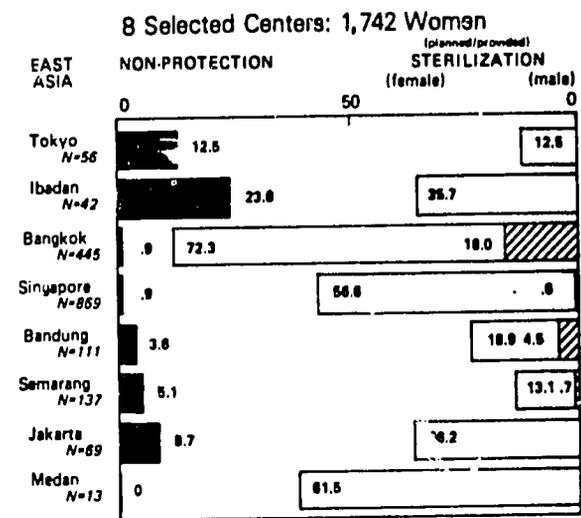


Table 3. Women With Three Living Children Postpartum Who Do Not Want Additional Children. An Index of Planned Male Sterilization as Indicated Postpartum by the Women Is Ranked in Descending Order.

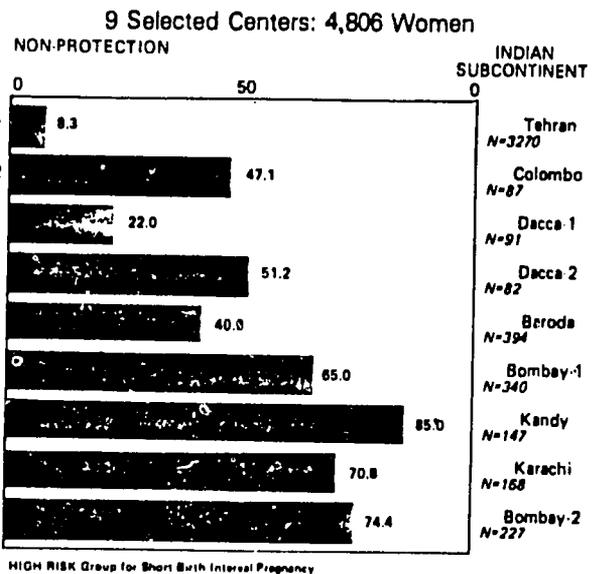
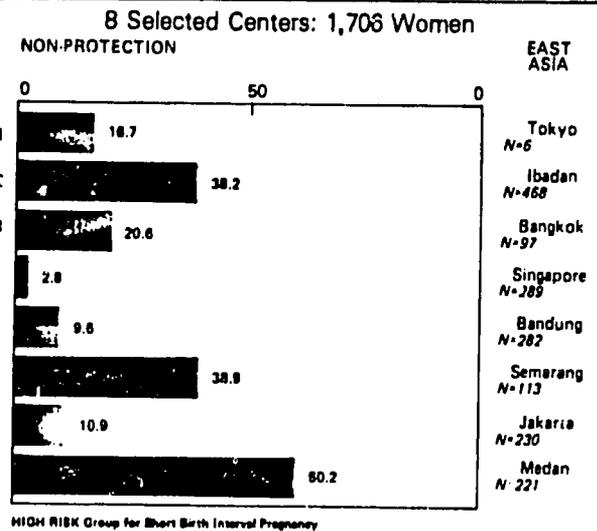
Order	Center	Postpartum Intention		Index of planned male sterilization (b/a)
		% either partner sterilization (a)	% male sterilization (b)	
1	Bandung	23.4	4.5	.192
2	Bangkok	88.3	16.0	.181
3	Baroda	75.7	11.9	.157
4	Dacca-2	21.1	2.2	.104
5	Bombay-1	70.5	3.8	.054
6	Bombay-2	79.0	4.1	.052
7	Semarang	13.8	0.7	.051
8	Kandy	48.7	2.2	.045
9	Colombo	53.9	2.1	.039
10	Singapore	57.2	0.6	.010
11	Tehran	6.0	0.0	.000
	Tokyo	12.5	0.0	.000
	Karachi	20.0	0.0	.000
	Dacca-1	22.2	0.0	.000
	Ibadan	35.7	0.0	.000
	Jakarta	36.2	0.0	.000
	Medan	61.5	0.0	.000

women with three living children postpartum who intend to have further children ranges from 2.8% (Singapore) to 85.0% (Kandy) as shown in Figures 9 and 10. In general, there is a tendency for greater nonprotection rates for the Indian subcontinent than for the centers in East Asia. The centers in Bombay-1, Bombay-2 and Karachi have nonprotection rates between 65% and 75%. Furthermore, within countries the differences in nonprotection rates between various centers is noteworthy; Kandy vs Colombo in Sri Lanka (85.0 vs 47.1), Bombay-2 vs Baroda in India (74.4 vs 40.9), Dacca-2 vs Dacca-1 in Bangladesh (51.2 vs 22.0), and Medan vs Bandung in Indonesia (60.2 vs 9.6).

DISCUSSION

Examination of fertility expectations by fertility attainment reveals differences in expectations among centers in the same country (Table 1 and Figures 3 and 4), although they are not as large as intercountry variations. In Sri Lanka, for example, the center in Colombo ($ACD_{50} = 2.23$) appears to have a smaller family size norm than the one in Kandy ($ACD_{50} = 2.69$). Routine monitoring of fertility expectations by fertility attainment on a national multicenter level should assist ministries of health and national population and family planning boards to (a) ex-

Figures 9 & 10. Rate of Non-Protection for Women with Three Living Children Postpartum who Want Additional Children.



amine the *unique national map of fertility behavior and expectations*, which could become a solid basis for charting out national family planning programs, and (b) study the *changes over time (trend studies)* made possible by updating this national map. Trend studies possible through routine monitoring can further benefit policy and planning bodies by providing a source of information on the degree and speed of changes relative to the specific regional family planning program inputs.

Women who want additional children but do not intend to protect themselves postpartum (Figures 9 and 10) constitute a *group at high risk for a short birth interval between this birth and the next birth*. High rates of non-

protection among these women indicate the need for institutional promotion of contraceptive protection to lengthen the birth interval, thus making a significant health input into families with relatively few children.

Women who do not want additional children but do not intend to protect themselves postpartum (Figures 5-8) constitute a *group at high risk for genuinely unwanted pregnancies*. These women need active motivation, counseling and education incorporated in their obstetric care to preserve their present desired family size and to avoid the risk of criminally induced abortions linked with high morbidity and mortality.

Because women not wanting additional children can face up to 20 or more years of exposure to unwanted pregnancy, *voluntary sterilization often emerges as the surest and most appropriate means of protection*. The wide range of actual postpartum sterilization services among women who say they desire the operation (Table 2 and Figures 5 and 6) indicates the need to examine the causes of low service rates, which may be the result of space, equipment and/or personnel shortages that can be remedied.

In Dacca, the great difference between the two neighboring institutions may point to differences in the availability of surgical services in one of the two medical colleges (.508 vs .955). The four Indonesian centers exhibit high surgical service indices. The financing of surgical availability postpartum, as based on expressed needs identified through MCM, is most likely to be very cost-effective in preventing future unwanted births.

The number of couples planning male sterilization (Table 3) is most likely linked to its local availability and promotion, which in turn partly determine acceptability. The observed differences among centers within a country merit the attention of the directors of maternity services so that *a common policy for the promotion and availability of male sterilization can be developed*. Such a difference emerges in Dacca for the two maternity centers: while in both centers about one-fifth of all women with three living children who do want additional children elect sterilization of either partner, 10.4% of these sterilizations are intended for the male partner in one center as compared with none in the other center. The promotion of male sterilization in one of the two centers would appear to be the main reason for this marked difference.

CONCLUSION AND OUTLOOK

The analysis of MCM studies focusing on reproductive expectations and contraceptive behavior/service postpartum in Asian maternity centers shows:

- The feasibility and usefulness of monitoring both reproductive attainment and family size expectations with a view toward counseling the women to choose an appropriate method of contraception. Pattern and trend studies of family size expectations at vari-

ous centers across a nation bring new insights of direct interest to planning bodies and policy-makers working in the fields of public health and population. Two indices of cross-sectional family size expectations show sensitivity and thus have potential for classification of maternity centers.

- The feasibility and usefulness of monitoring contraceptive intentions postpartum for two groups of women:

Women who do not want additional children. Two proposed indices (surgical service index and index of planned male sterilization) reveal basic unmet needs in education and motivation postpartum in many maternity centers. An "all-or-none" contraceptive protection pattern was noted in various centers on the Indian subcontinent reflecting the neglect of methods other than sterilization. A group at high risk for genuinely unwanted pregnancy was identified and quantified (range: 0.4%-26.4%).

Women who want additional children. To facilitate stricter comparison among centers, the analysis was restricted to women with three living children postpartum—a fertility level conducive to family planning acceptance by virtually all ministries of health around the world. A group at high risk for a next short birth interval was identified and quantified (range: 2.8% - 85.0%).

- The findings have implications beyond Asia. Maternity care should be routinely monitored because it shows *center-specific unmet needs* to provide, among others, counseling and reproductive care services postpartum as an integrated part of obstetric care, antepartum and postpartum.
- Maternity care monitoring can assist in the most cost-effective use of local resources available for MCH care. Ministries of health should review the feasibility of monitoring trends of fertility behavior and contraceptive service delivery at the various outlets of obstetric care. A network of provincial/district/subdivisional maternity centers may report to the ministry of health and/or centers of learning and institutions responsible for population activities. In turn, these intermediate centers should be focal points of reporting by satellite maternity centers in rural areas. These kinds of tiered service statistics, collected for programmatic intervention, are one response to a recommendation in the World Plan of Action, adopted at Bucharest in 1974 by the United Nations World Population Conference (6). Indeed the statement that "monitoring of population trends and policies should be undertaken continuously as a specialized activity of the United Nations and reviewed biennially by the appropriate bodies of the United Nations system, beginning in 1977" may be modified in a practical, down-to-earth manner by changing it to read: *The monitoring of trends of fertility behavior and contraceptive service delivery should be undertaken continuously as a specialized*

routine activity of the ministries of health and those concerned with population in general and reviewed annually by the appropriate national bodies, beginning in 1980. The United Nations Fund for Population Activities (UNFPA) should consider the beneficial implications in orienting the governments on the birth of a new and workable service delivery monitoring tool.

- MCM also shows great promise for "satellite monitoring" linking the two pyramids of health delivery management: institutional and primary health care (7). To date, the primary health center (serving 50-100,000) lacks monitoring capability. MCM records could be used at peripheral health care institutions, contributing toward the World Health Organi-

zation/United Nations Children's Fund goal of "health for all by the year two thousand" (8).

ACKNOWLEDGMENTS

The Asian national programs of fertility and/or family health research (BFRP, BKS PENFIN, FRP/SL, INDIA FRP, SFRP and TFRP) are thanked for stimulating and pulling together the data, which were in part processed in Asia. The individual contributors in Japan (Profs. S. Sakamoto and R. Iizuka), Singapore (Prof. S.S. Ratnam), Pakistan (Prof. R. Ansari), Iran (Dr. F.S. Ghorbani) and Nigeria (Prof. O.A. Ojo) are thanked for contributing to this review.

Prof. A. Omran's review of the analysis sequence is gratefully acknowledged. Lani Cartier is thanked for drawing the regional charts. Thanks are due to Dr. E. Kessel for continuous stimulation of MCM and the careful reading of this paper resulting in pertinent suggestions. Finally, Dr. M. Schima deserves credit for proposing the topic of this paper.

REFERENCES

1. Bernard, R.P., et al. 1979. International maternity care monitoring: results of a pretest. *Int. J. Gynaecol. Obstet.* 17 (1): 24.
2. Bernard, R.P. and Kendall, E.M. and Manton, K.G. (in press, 1979). International maternity care monitoring: a beginning. In *Clinical perinatology*, 2nd ed., eds. S. Aladjem and A.K. Brown. St. Louis: C.V. Mosby and Co.
3. Bernard, R.P. 1977. Maternity care monitoring: a new opportunity in service statistics. *Population Reports*, series J, no. 17 pp. 338-39.
4. ——— 1979. International maternity care monitoring: postpartum family size expectations and contraceptive behavior/service in Asia. A pictorial report on 17 studies with 59,386 women (MCM-6). Paper read at the 4th International Conference on Voluntary Sterilization, 7-10 May 1979, Seoul, Korea.
5. Indonesia's family planning story. 1977. *Population Bulletin* 32 (6). November.
6. United Nations. 1979. *United Nations World Population Trends and Policies*. 1977 Monitoring Report, vol. 1, Population Trends, and vol. 2, Population Policies. New York.
7. ———. 1979. *Report of Mission on Needs Assessment for Population Assistance: India*. United Nations Fund for Population Activities, Report no. 12. New York.
8. ———. 1978. *Report of the International Conference on Primary Health Care*. World Health Organization/United Nations Children's Fund Conference on Primary Health Care, 6-12 September 1978, Alma Ata, USSR.