

VOLUNTARY STERILIZATION SERVICES DEVELOPMENT

World Epidemiology and Potential Fertility Impact of Voluntary Sterilization Services.

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VOLUNTARY SURGICAL STERILIZATION, a 20th century phenomenon, has increased so rapidly during the last decade, that it is now the foremost means of fertility control in the world. It will become extensively available and will be used in virtually every country during the next decade (1 -3)

Vasectomy, introduced experimentally during the 19th century, and used in a limited fashion mainly for eugenic reasons during the first half of the 20th century, became a popular means of fertility control in a number of countries during the 1960s and 1970s.

Female sterilization, usually accomplished by hysterectomy during earlier decades, gradually gained popularity as a postpartum and interval method after introduction of tubal ligation in the 1930's (5).

But availability and use of both male and female voluntary surgical sterilization services remained a private and often furtive matter throughout the first half of the 20th century -- with a few exceptions, most notably Puerto Rico.

PUERTO RICO

Beginning in the 1930's and forging ahead in the 1940s, 1950s and 1960s, Puerto Rico and the United States became the world leader in the use of voluntary surgical sterilization, especially, tubal ligation, as a foremost means of fertility control (6).

Serial surveys documented the extraordinarily rapid increase in the number of Puerto Rican couples depending upon sterilization - 6.6% in 1947-48, 16.5% in 1953-54, 32% of ever-married women 20-49 years of age in 1965, and 35% in 1970 (2, 6).

The similar rapid increase in use of voluntary surgical sterilization in many countries during the last decade suggests that Puerto Rican acceptance of sterilization during the 1950s and 1960s presaged world acceptance of sterilization during the 1970s and 1980's; that the levels of sterilization acceptance achieved in Puerto Rico, although extraordinary in the past, will likely be matched and even exceeded by many countries during the next decade.

Although the facts underlying Puerto Rico's leadership in the surgical sterilization field are already somewhat obscured by time, it seems clear that this phenomenon was not due to greater need for sterilization by Puerto Rican women than by women in many other lands. Rather, it can perhaps best be ascribed to the confluence of several main factors which operated to make surgical sterilization services much more available and acceptable in Puerto Rico than elsewhere.

In 1934, President Franklin Roosevelt appointed Dr Ernest Gruening Governor of Puerto Rico. Dr. Gruening, an extraordinarily capable and dedicated man and already an outspoken advocate of birth control during the 2 previous decades, initiated a family planning program in Puerto Rico, and backed it with the considerable power of the (Governor's office (7)). Likewise, Governor Munoz extended official support for family planning activities during subsequent years (8).

Within this unusually favorable political setting, offsetting to a considerable extent the negative religious pressures, a growing cadre of

gynecologic surgeons provided surgical services to Puerto Rican women who increasingly favored this method as they learned of its advantages from relatives and friends.

INDIA

After Puerto Rico and the United States, the next country to take the lead in the use of voluntary surgical sterilization as a means of fertility control on a national scale was India. Beginning in the 1950's with a few thousand sterilizations per annum (approximately equally distributed between males and females) the number of sterilizations performed annually gradually rose --from 64,000 in 1960, to half a million in 1965, to 1-1/2 million in 1970, and to more than 3 million in 1972 (9). After the peak number in 1972, mainly vasectomies performed in camp settings (10), the annual level dropped to about 1 million in 1973 and 1974.

But the growing availability and popularity of advanced techniques of female sterilization lifted the 1975 level to more than 3 million sterilizations, more than half of which were female. Through 1975, India performed approximately 19.5 million sterilizations (8 million female and 11.5 million male), and approximately 17 million couples are estimated to be currently depending upon this method of fertilizations control (11) .

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UNITED STATES

With greatly increased public awareness of population and environmental pollution problems. and with strong leadership from the Association for Voluntary Sterilization, surgical sterilization has rapidly become a popular means of fertility control in the United States during recent years.

The proportion of married couples depending upon this means of fertility control increased from approximately 10% in 1960, to 18% in 1970, to approximately 25% in 1975 (1-3, 12).

During the first 5 years of the 1970's, sterilizations in the U.S. were being performed at the rate of approximately 1 million per annum, with roughly equal numbers of male and female procedures. The number of U.S. couples depending upon sterilizations for control of fertility now exceeds 8 million (12), and the proportion of couples using this method (approximately one-fourth) is probably the highest rate for any major country, except perhaps the People's Republic of China.

Recent trends indicate that the number of U.S. couples depending upon sterilization will continue to increase for some additional years; and that within 2 years, sterilization will forge ahead of oral contraceptives as the foremost means of fertility control in the U.S. Within several years the level of sterilization in the entire U.S. should be similar to that already achieved in Puerto Rico, with more than one-third of couples depending upon this method.

PEOPLE'S REPUBLIC OF CHINA

With its huge population, estimated at 876 million in mid-1975 (13), (22% of the world's total) and its powerful planned birth program with particular emphasis upon surgical sterilization (14), the People's Republic of China

necessarily dominates the world sterilization scene. No general report of the achievements of its family planning program has been made by the PRC to international agencies. But the combination of performance data from scattered localities and municipalities (14.15), together with knowledge of population and program structures, policy directives, and the general and ready availability of surgical sterilization at the commune hospital level, gives some basis for the ballpark estimate that at least 30 million Chinese couples now depend upon sterilization for control of their fertility.

WORLD DISTRIBUTION OF STERILIZATION

With leadership from the People's Republic of China, India, and the United States, voluntary sterilization has during the last several years become the foremost means of fertility control in the world, with roughly 65 million couples depending on this method at the beginning of 1976. The approximate distribution of these sterilizations by country and continent is presented in Table 1.

TABLE 1

ESTIMATED NUMBER OF COUPLES CONTROLLING FERTILITY
BY VOLUNTARY SURGICAL STERILIZATION
BY COUNTRY AND CONTINENT December 31, 1975*

United States	8 million
Canada	1 million
Latin America	2 million
Africa	0.5 million
Europe	4.5 million
India	17 million
China	30 million
Asia, other	2 million
World Total	65 million

*Estimates by author on basis of Family Planning Service Statistics (9) and discussions with colleagues.

From a continental point of view, it is clear that the great majority of the world's sterilizations -- more than 50 million -- have been performed in Asia, and that sterilization is only beginning in Africa. A large degree of uncertainty exists concerning the number of couples depending upon sterilization in Europe and Russia, where sterilization is still a very sensitive subject, especially in France and Germany, but where sterilizing gynecologic surgery is frequently performed.

The number of couples depending upon sterilization is compared with those depending upon other means in Table 2. It is noteworthy that the IUD, which was envisioned by many a decade ago as most likely to become the leading means of fertility control in developing countries, is now fourth (last) among principal contraceptive methods. Even the lowly condom, aided by lubrication, coloring, and attractive packaging, remains far ahead of the IUD. Indeed, it is now clear that the one-time motivation rationale for IUD use, which was predicted but did not occur due to bleeding discomfort and drop-outs, is occurring much more surely with surgical sterilization.

TABLE 2

ESTIMATED NUMBER OF COUPLES CONTROLLING FERTILITY WITH EACH CONTRACEPTIVE MEANS† December 31, 1975

Sterilization	65 million
Oral Contraceptives	55 million
Condoms	30 million
Intra-Uterine Devices	15 million
	165 million

† In addition, it is estimated that roughly 30 million abortions were performed during 1975.

THE POTENTIAL OF STERILIZATION

The experience of a number of countries in the vanguard of the world sterilization movement -- China, India, United States, Thailand, and Sri Lanka, clearly indicates that the potential of voluntary sterilization as a means of fertility control is enormous, that the stage is set for it to become the foremost means of fertility control in virtually every country. The rising trend in the number of couples using sterilization during recent decades is shown in Table 3. It is foreseeable that the number of sterilizations performed during the next 5 years will substantially exceed the 50 million performed during the last 5 years and that by 1985 more than 200 million couples will be using this method. No doubt, because of great advances in female sterilization techniques (16-21), the great majority of sterilizations in the future will be female. Male sterilization remains a useful procedure, but it necessarily constitutes an indirect way of controlling fertility, and its value diminishes with increasing sexual freedom of women. *

TABLE 3

ESTIMATED NUMBER OF COUPLES DEPENDING UPON SURGICAL STERILIZATION FOR CONTROL OF FERTILITY*

Year	Million Couples
1950	3
1960	5
1970	15
1975	65
1980	130
1985	200†

*Includes hysterectomies

Intense demand for female sterilization wherever good quality services have been made available on an initial basis -- in Nepal, Pakistan, Bangladesh, India, Thailand, Korea, the Philippines, Tunisia, Egypt, Costa Rica, El Salvador, Colombia, Jamaica, and so forth -- indicates tremendous pent-up demand for female sterilization services and urgent need for extension of such services throughout the developing world (1. 3).

The magnitude of the service task before us is indicated by the size and distribution of the world population (Table 4). Of the 4 billion people in the world, over half live in developing countries, not including the People's Republic of China. Approximately one-fifth of these, 400 million, are women of reproductive age. And it is likely that more than 100 million additional

couples in the developing countries will accept female sterilization during the next decade if services are made fully available.

**Editors note: The editors do not necessarily agree with this viewpoint, since women's increasing sexual freedom is due, in part, to an increased willingness by males to assume a share of responsibility in contraceptive decision-making and family planning.*

What numbers of trained personnel and surgical facilities will be needed for this task?

Fortunately, the number required is rather less than might initially be thought necessary. A well-run surgical clinic should be able to average at least 10 sterilizations per surgical session and at least 2,000 sterilizations per annum. Five such surgical service clinics

TABLE 4

DEMOGRAPHIC ESTIMATES FOR THE WORLD AND ITS REGIONS, 1974*

Geographic Region	Midyear 1974 Population (thousands)	Estimated Crude Birth Rate	Approximate Number of Births	Estimated Crude Death Rate	Approximate Number of Deaths	Natural Rate	Increase Number
World	3,881,342	28.1	109,259,611	11.8	45,956,272	1.63	63,303,339
North America	235,095	15	3,507,556	9	2,092,142	0.6	1,415,414
Latin America	282,157	38	10,717,866	9	2,586,465	2.9	8,131,401
Caribbean Islands	26,221	31	807,378	9	229,229	2.2	578,149
Europe	714,516	16	11,647,888	10	6,982,888	0.6	4,665,000
Africa	353,744	47	16,654,034	20	7,274,631	2.6	9,379,403
Near East	159,356	40	6,332,638	13	2,029,231	2.7	4,303,407
South Asia	782,485	39	30,227,273	16	12,986,442	2.2	17,240,831
South East Asia	312,028	35	10,965,421	15	4,614,795	2.0	6,330,626
East Asia	994,833	18	17,926,974	7	6,969,557	1.1	10,957,417
Oceania	20,907	23	472,583	9	190,892	1.3	281,691

*Inescapably, a lag of more than a year ordinarily occurs in the collection and analysis of world demographic data. Estimates by the Office of Population, U.S. Agency for International Development, January 1976

should be able to perform 10,000 sterilizations per annum and in 5 years provide the 50,000 sterilizations needed to reach the level of 25% prevalence among the 200,000 women of reproductive age in a general population of one million.

Application of this formula to the developing world indicates that a total of approximately 10,000 surgical service clinics are needed--1000 in Latin America, 2,000 in Africa, and 6,500 in Asia.

Also, surgical training centers are needed in the ratio of approximately 1 STC per 5 million general population, i.e., 400 in the developing world.

Actually many of these training centers and service clinics are already operational. During the last 4 years, through the Association for Voluntary Sterilization and the Johns Hopkins Program for International Education in Gynecology and Obstetrics (UHPiEGO), AID has trained hundreds of surgical

leaders and provided laparoscopes and related equipment to their institutions (Table 5). Now a concerted effort must be made to seed the knowledge and means for advanced techniques of fertility management into every country.

The task is substantially advanced, but more than 200 additional surgical training centers and 5000 additional surgical service clinics must be established. On the basis of experience to date it is estimated that at least \$50 million will be needed during the next 5 years to establish these training centers and service clinics, plus arranging to somehow handle the recurring costs.

IMPACT OF STERILIZATION ON FERTILITY

Each means of fertility control necessarily interplays with other possible methods and so it is exceedingly difficult and usually impossible to measure the exact impact of each chosen method. Nevertheless, consideration of age-specific fertility patterns (Figure 1) in the light of age, parity, and prevalence patterns now emerging for sterilization, suggests that full availability of sterilization to populations in developing countries, would reduce fertility among women over age 30 in these countries to approximately the Japanese and Taiwanese levels.

In many countries, full application of voluntary surgical sterilization

TABLE 5 AID FUNDED LAPAROSCOPE PLACEMENT BY YEAR

Country	1972	1973	1974	1975	Total	Country	1972	1973	1974	1975	Total	
1. Afghanistan				1	1	28. Liberia				1	1	2
2. Antigua				1	1	29. Malaysia	1	1	4	2	8	
3. Bangladesh		1	3		4	30. Mexico		1	2	1	4	
4. Barbados			2		2	31. Nepal	1	1	3	13	18	
5. Brazil		2		6	8	32. Netherland Antilles			1	1	2	
6. Bolivia				3	3	33. New Guinea			1		1	
7. Chile		2	3	1	6	34. Nicaragua				5	5	
8. Colombia		5	23	2	30	35. Nigeria				5	5	
9. Costa Rica	2	3	13		18	36. Pakistan		1	6	7	14	
10. Ecuador	1	2			3	37. Peru		1	5	2	8	
11. Egypt			6	1	7	38. Panama	1	1		3	5	
12. Gambia			1	1	2	39. Philippines		7	36	12	55	
13. Ghana				1	1	40. Saudi Arabia				1	1	
14. Guatemala		4	3	6	13	41. Santa Lucia				1	1	
15. Grenada				1	1	42. Senegal				1	1	
16. Guyana			1		1	43. Singapore		2	3		5	
17. Honduras		1		3	4	44. St. Kitts				1	1	
18. Haiti				2	2	45. El Salvador	3	4	1	9	17	
19. India	3	6	14	5	28	46. Taiwan		2	6	1	9	
20. Iran		2		2	4	47. Thailand	1	3	19	15	38	
21. Indonesia		1	3	2	6	48. Trinidad			3	1	4	
22. Jordan			1	1	2	49. Turkey		2	7		9	
23. Jamaica		4	7	4	15	50. Venezuela			1	1	2	
24. Kenya			2		2	51. Vietnam			1		1	
25. Khmer Republic			1		1	52. Zaire			1	1	2	
26. Korea		4	3	50	67	53. Sudan				2	2	
27. Lebanon		1		2	3							
						TOTAL	13	64	187	191	455	

would reduce fertility more than 25 percent which would be a mighty contribution toward solution of myriad problems generated by excessive reproduction within developing countries.

Figure 1 omitted because of Mega-byte storage requirements

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