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World Population Problems: An Overview

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Between now and the end of the century, the world will add to its numbers as many people as inhabited the planet when the Reverend Thomas Malthus wrote about human population growth in 1798. Rapidly growing populations are young populations, and half the current population of the world is below the age of marriage, which means that we are already committed to a continuing rapid expansion of human numbers until well into the twenty-first century. The rate of global population growth has fallen marginally, but the absolute increase continues to accelerate. By happenstance, the annual global population growth is approximately in step with the calendar year: 89 million more in 1989; 90 million in 1990 and so on until well into the 1990s, or even to the end of the century.

In 1950 there were 2,500 million people in the world; today there are 3,000 million in Asia alone and more than 5,000 million in the entire world. Barring an unprecedented rise in the death rate, there will be 8 billion people sometime in the first half of the next century. The statistics are numbing: 26 billion tons of top soil and 22 million hectares of forest are lost each year. High

numbers of plant and animal species will become extinct by the year 2000.¹ We were not evolved to adapt to such rapid changes coming at us in so many directions. The world is becoming a measurably hotter, more polluted, less healthy, more politically unstable, overcrowded place. Unless rapid action is taken, our children and grandchildren will inherit an impoverished planet painfully and deeply scarred by vast areas of poverty and perhaps with an environment that is irreversibly damaged.

This article looks at some of the possible consequences of rapid population growth and then asks how rapidly can human fertility decline and what are the limits to the rate of change. It concludes that the 1990s are likely to be the last decade when voluntary and relatively painless solutions can be applied to the problems of rapid population growth and inequalities of development.

The Limit to Human Numbers

This rapid population growth contributes to the economic differences between North and South and to obscene differences in health. Eighty-five percent of the world's babies are born in third world countries, 95% of the infant deaths take place in these countries, and 99% of maternal mortality takes place in these same countries; one woman each minute dies somewhere in the

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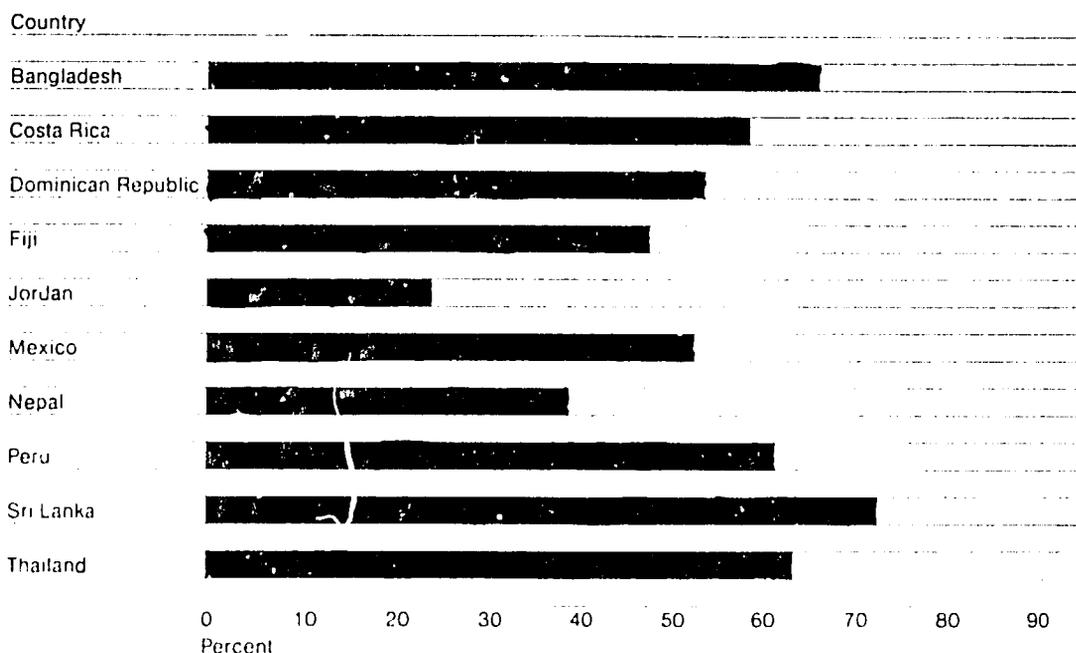


FIG. 1. *Percent of women with three living children who want no more children, 1974-1977. (Reprinted with permission from Maine D. Family planning: Its impact on the health of women and children. New York: Center for Population and Family Health, Columbia University, 1982.)*

third world from childbirth or the consequences of abortion. Deaths to women and infants are concentrated at the extremes of fertile life among teenagers and women with many children. These are the groups where most unintended pregnancies occur.

New and existing sexually transmitted diseases also pose grave threats for the future. Chlamydia (which can cause infertility) and the human papilloma virus (which can cause cervical cancer) have increased six-fold or seven-fold in the United States in the last decade. AIDS will bring death to millions of individuals throughout the world. Guesses of the number of individuals with HIV infection around the world vary enormously, but the WHO estimates that between 5 million and 10 million people are currently infected with HIV, and by the year 2000 nearly all these individuals may have died and a much larger number will then be carrying the virus. Even so, AIDS will only kill several months of global popu-

lation growth. Even in hard-hit countries, such as Uganda, AIDS will slow population growth but not reverse it.

Limiting Family Size

Side by side with these unprecedented problems are some unprecedented opportunities. Although we may agree that population is not the only problem facing us, oddly it is probably more easily "solved" than many others. It is easy to forget we were evolved to be the slowest breeding animal known to science. We have a later puberty than an elephant, a longer pregnancy than some whales, we experience long intervals of anovulation while breast-feeding, and alone among the primates we have a universal and easily recognized menopause. Today's explosive population growth is recent and will be short-lived. It is not only due to declining infant mortality but to a marked fall in the age of puberty and pro-

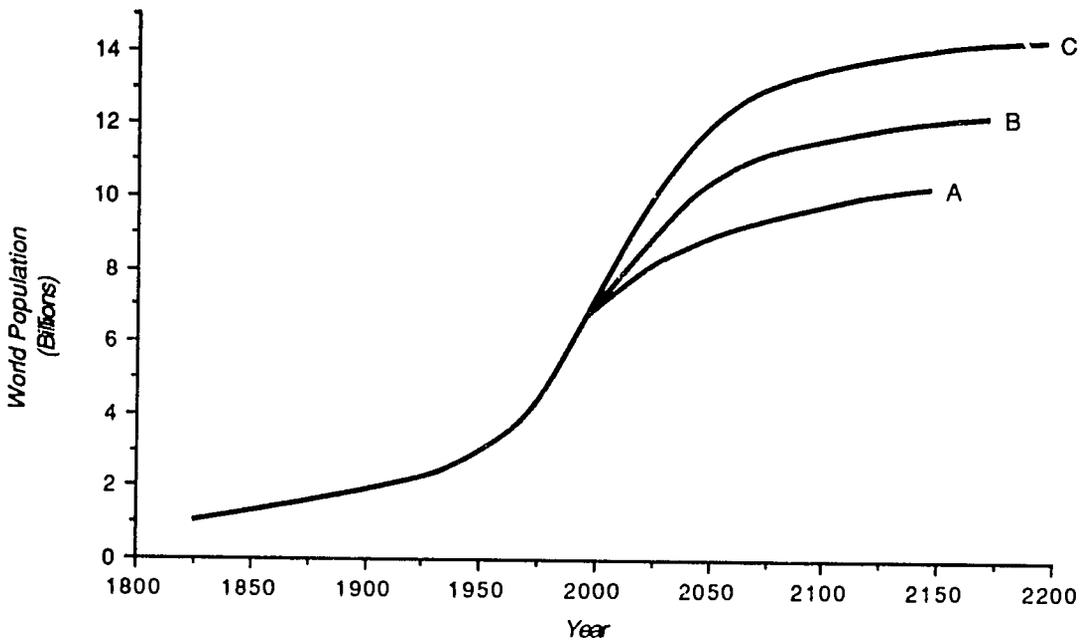


FIG. 2. *The critical 1990s.* World population projections depend on when the absolute annual increase in global population begins to decelerate. If this occurs in 1995 (curve A), population will stabilize at over 10 billion in 2151; if the point of inflection is delayed a mere 7 years (curve B), there will be 2 billion more people; if deceleration does not begin until 2010, then global population will grow until it reaches more than 14 billion in the twenty-second century (curve C).

found and deleterious changes in patterns of breast-feeding. However, all over the world, there is evidence that desired family size is smaller than achieved family size.

Desired family size in developed countries has already fallen to uniquely low levels. The average American only plans to have 1.25 children, although unintended pregnancies push the total fertility rate (TFR) in the United States to 1.8. Many European countries have birth rates below replacement levels for their population. The World Fertility Survey and the Demographic and Health Surveys sponsored by the US Agency for International Development have drawn a remarkable picture of the desire for relatively small families in third world countries (Fig. 1).² One half of all third world women with three or more children do not want anymore. Each year an estimated 30 million to 45 million women around the world have an induced

abortion, many of them illegal and highly dangerous. There could be no more vivid indicator of the desire to control fertility.

The great discovery of the 1970s was that family planning programs do work and that human fertility can fall rapidly. Contraceptive prevalence can rise rapidly in developing countries, given good programs.³ It took 58 years for the TFR in the United States to decline from 6 to 3.5 (1842–1900). It took less than 30 years for a similar change to occur in Sri Lanka and Indonesia, 15 years in Thailand, and a mere 7 years in China.

From what we know about the desire to control fertility and the logistics of making family planning services available, it should be possible to greatly increase global contraceptive prevalence in the 1990s. If this is done, it will make a profound difference to world population in the twenty-first century (Fig. 2).

The Limits to Family Planning

Effective Programs

Given adequate access to family planning services, it appears couples will have fewer children.^{1,2} It is easier in countries that also get rich quickly, such as Korea, but can also happen in poorer countries, such as Thailand. In the 1960s the Royal Thai government gave medals to women who had 10 children; today the King's Birthday Holiday is turned into a vasectomy festival with literally thousands of operations on one day. The most successful family planning services⁶: 1) sell condoms cheaply, as in social marketing; 2) deliver oral contraceptives without prescription through some culturally acceptable community-based distribution system; 3) offer the choice of female and male sterilization, without arbitrary limits of age and parity; in the cities this may mean endoscopic tubal occlusion or minilaparotomy; in the villages it means minilaparotomy in primary health centers or if all other options fail in large camps; and 4) maintain long intervals of breast-feeding.

Lactation is nature's contraceptive.⁷ In much of the world, traditional patterns of breast-feeding avert more pregnancies than modern methods of contraception. In Bangladesh women not using contraceptives have their babies approximately 30 months apart because most breast-feed for 2 years or more. In sub-Saharan Africa, breast-feeding still remains 10 to 40 times as demographically significant as the adoption of modern methods of contraception, in Asia both contraception and breast-feeding are important, and in Latin America breast-feeding intervals have become so brief that they only contribute a small amount to the reduction in the total fertility rate.

No society has ever controlled its fertility merely by using one method, although some policymakers, as in India, continue to emphasize single method "solutions" to family planning problems. To raise contraceptive prevalence to demographically sig-

nificant levels, it is essential to offer as wide a variety of fertility regulation methods as possible; and to offer the same methods through various channels of distribution from hospitals and health clinics to vending machines and teastalls. Experience in Matlab, Bangladesh (Fig. 3) shows how important it is to offer a variety of contraceptive choices if contraceptive prevalence is to rise.

Abortion is the most controversial aspect of family planning. However well family planning services are designed, there will be some abortions. An absence of family planning, as in Burma, will be associated with more abortions than an effective family planning program, as in Indonesia. Whether abortion is legal or illegal probably makes little difference to the total number of abortions. Chile, where abortion is illegal, has a higher abortion rate than Tunisia, where abortion is legal. The real difference between legal and illegal abortion is the relationship to the rest of family planning. Countries in which abortion is illegal rarely offer family planning, whereas those that offer legal abortion services generally do. Abortion is usually the first aspect in a clinic to become financially self-sufficient. People, on average, will (and generally can) afford to pay 1 week's disposable income to obtain a safe abortion.

Adequate Resources

Once the right programs are in place, what are the factors that limit their expansion? The immediate problem is lack of financial resources. There is not enough money for starting new programs or expanding existing ones. Already, highly successful family planning programs, such as the social marketing scheme in Bangladesh, are confronting the lack of money to buy the contraceptives.

As family planning succeeds, the cost of services will grow, rapidly eating up the budgets currently available for family planning. Several different approaches need to

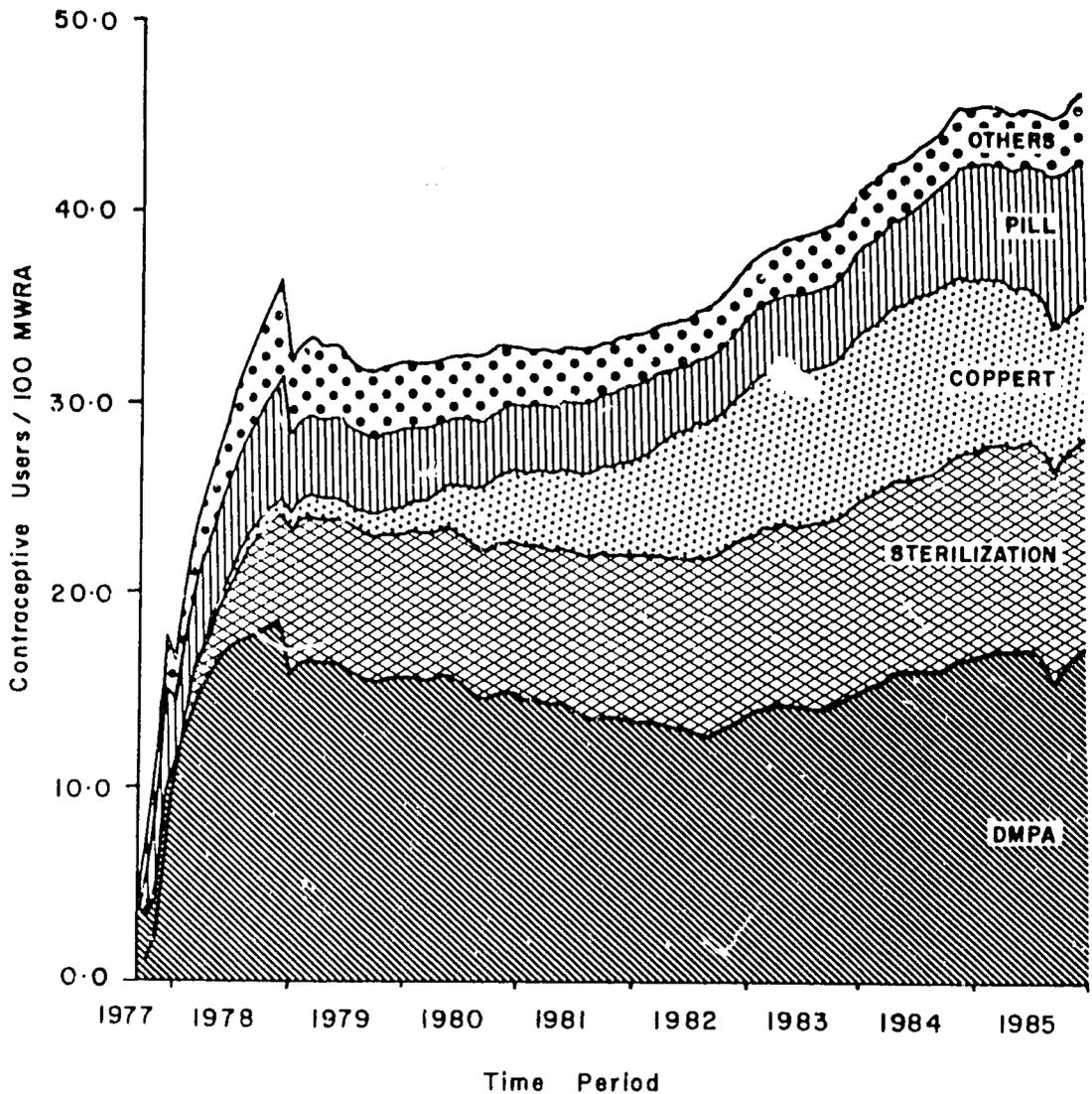


FIG. 3. Trends in contraceptive prevalence in Matlab, Bangladesh (population 200,000). (Reprinted with permission from Phillips JF. *A case study of contraceptive introduction: Domiciliary DMPA services in rural Bangladesh*. [unpublished observations].)

be taken now to overcome likely shortages of money. Experiences from many less developed countries (LDCs) show that social marketing and voluntary sterilization are the two most cost-effective ways of providing the largest numbers of couples protection against pregnancy.

Social marketing (also known as commercial retail sales) uses the trade infrastructures already present in a country to pro-

vide a culturally acceptable system of contraceptive distribution readily compatible with local social and religious mores. Socially desirable products become a part of the daily life; contraceptive users are not clients or acceptors but consumers making an informed voluntary choice among many available alternatives. Social marketing is doubly important because of its demonstrated ability to reach large numbers of

people, including many millions among the lower socioeconomic groups rapidly and cost-effectively. Social marketing is rapid to implement and a relatively cheap way of distributing contraceptives on a large scale to a poor community that cannot afford the full cost of services.

The most successful program was launched by Population Services International (PSI) in Bangladesh in 1975 and now extends protection to 1.6 million couples. It is responsible for selling 7 million condoms, 150,000 cycles of pills, and 300,000 foaming tablets per month. The Indian program is being reinvigorated and social marketing programs have also been initiated in Jamaica, Pakistan, Honduras, and Colombia. Almost invariably, the private sector—both for-profit and not-for-profit—has greater freedom to hire (and fire) good managers, than governments, where salaries are usually low and security of employment high.

Social marketing programs need to be multiplied rapidly in many other countries. It is essential the UNFPA, World Bank, and bilateral donors look more carefully at social marketing programs and ask business-like questions about the cost per couple years of protection (CYP). Goals should be set in CYP achieved, rather than in softer measures such as new acceptors, or least meaningful of all, conferences held, people trained, or posters printed.

Family planning programs will only become more cost-effective if greater attention is given to management. Inevitably, some programs have failed, but this has often been due to poor external assistance. There is also a broad spectrum of performance. For example, one program supported by the US Agency for International Development (AID) in the early 1980s spent \$30 for each CYP, whereas the PSI program, working in difficult countries, was costing \$3 per CYP.

Even in Bangladesh, where condoms sell for less than 1 cent each, 10% of the total costs (including contraceptive costs) are re-

covered in sales. Clearly, as people get richer, they will be able to afford to pay for the methods, but it is realistic to assume that in nearly all of sub-Saharan Africa and in most of the Indian subcontinent the majority of people are going to need their pills, condoms, and long-acting steroids subsidized until well into the twenty-first century.

It is essential to increase the volume of contraceptives sold because not only are more people served but high volume programs are also more cost-effective. It is practical and useful to develop a variety of contraceptive brands and selling prices to increase cost recovery. Changing the contraceptive mix can also assist program expansion within today's resources. Some family planning methods (e.g., the insertion of an IUD and using oral contraceptives) are more cost-effective than others (e.g., recurrent use of condoms), and existing and new programs must be encouraged to incorporate the less costly methods.

Unfortunately, the local production of contraceptives, although it may be valid in certain third world circumstances, may do little to solve the basic issue of the cost of commodities. Pills and condoms are capital-intensive products that are manufactured on thin margins in vast quantities at relatively few places. Third world production is sometimes of low volume and not always cheaper. Countries with the worst population problems usually often have the weakest foreign exchange situations.

There must be a clear understanding by donor and by international agencies that as family planning programs succeed in the 1990s a higher proportion of the available monies will have to be spent on the cost of contraceptives and on sterilization. Beginning in the 1960s, rich countries, led by Sweden and soon joined by the United States, set a precedent in purchasing contraceptives for third world countries. If the world is to be serious about family planning in the future, other industrialized nations

will have to join in buying contraceptives and there will have to be a large expansion in purchases in the 1990s.

The need for subsidy is likely to remain longest in relation to voluntary sterilization. Financially, sterilization is a "good buy" because it provides many years of protection against unintended pregnancy, but because it is expensive to involve the highly trained people that are required, it usually involves more up front money than many individuals in developing countries can afford.

Much more emphasis needs to be given to the private sector in developing countries. The over-the-counter sale of contraceptives and their private prescription by physicians account for the majority of contraception in North America, and even with the availability of family planning through the British National Health Service, a significant number of people still choose to use fee-for-service clinics. AID has focused interest on this area, but other international agencies, such as the UNFPA, largely ignore the potential of the private sector. Yet, some of the most cost-effective programs in the developing world have been associated with the development of an intelligent symbiosis between the private and public sector.

In Korea and Taiwan, appropriately trained private doctors have been successfully involved in IUD insertion and voluntary sterilization.⁹ By contrast, the Philippines, Egypt, or India (which also have many private doctors, at least in the urban areas) have largely ignored private doctors and depend on government financed family planning clinics.

Private practitioners may be especially appropriate for sterilization because if the patient pays even a small part of the cost, it is proof of a voluntary choice. By contrast, in a study of women in Honduras, Central America, a considerable proportion (over 40%) of women who had previously been interested in getting sterilized at the time of their last obstetric delivery were found in a follow-up study to be pregnant or to have

had experienced a recent pregnancy. Bureaucratic hurdles, overwork by the staff, and lack of incentive on the part of the physicians all contributed to the lack of choice.^{9,10} The harsh fact is that poor people often have a poor opinion of overcrowded state-run clinics often staffed by newly qualified doctors or by more mature doctors who come to the government clinics late and hurry away early in the workday to look after financially more rewarding private patients.

Currently, resources are limited because of a lack of political will to deal with the problems of global population growth. The sums of money needed are small compared with other global expenditures or the likely expenditures that rich nations will have to provide in the next 10 years in relation to debt relief for third world countries, emergency aid for famine and other disasters, and the immense complexity and expense of dealing with planetary problems, such as the greenhouse effect.

Lack of political will comes in large part from lack of understanding of the simple facts of demographic growth, lack of appreciation of the large unmet market for contraceptive methods, and lack of realism over the mix of methods, in particular, the role of voluntary sterilization and abortion. In turn, this confusion turns to a broader more subtle lack of understanding of both the nature of human reproduction and the philosophical basis of the decision, which should control the human freedom to control family size.

Speidel estimated that in mid-1987, there were 460 million sexually active women in developing countries, excluding China.¹¹ He assumed that approximately 75% of married couples of reproductive age would have to use contraception to stabilize the population. If it costs \$20 per CYP, then in theory it would cost \$7.5 billion annually to cover the family planning needs of third world nations, outside China. Nations will not reach these high levels of contraceptive

prevalence immediately, and approximately \$1.5 billion is already spent in these countries by donors and the third world nations themselves. In addition, private investment by the consumers of family planning is not insignificant. However, the number of women in need of care will increase by 50% between the mid-1980s (when calculations were made) and the year 2000, raising dollar needs to \$11.25 billion annually, ignoring inflation.

Gillespie et al. from the US Agency for International Development¹² have made similar estimates out to the year 2010, when there will be 1.3 billion married women of reproductive age in need of care in third world countries outside China. He assumes a less ambitious contraceptive prevalence than Speidel¹¹ with 556 million users in 2010 AD. Assuming \$18 per CYP, taking current world prices for contraceptive commodities and projecting a shift toward sterilization, the AID planners estimate \$800 million to \$1.2 billion annually in commodity costs and \$9.2 billion to \$9.6 billion in service delivery costs annually by 2010 AD.

Investment and Policy

The sums of money required are small in relation to the goals of health and economic progress they will help achieve, and they are trivial in relation to the consequences of failure to act. The world spends \$1 million a min on defense; it needs to spend an extra \$1 million dollars/hr on health and family planning. In only a handful of countries do medical personnel equal or outnumber military personnel; indeed, the list is so short it can be listed in toto: Canada, Venezuela, Britain, Scandinavia, Switzerland, Austria, Japan, Australia, Ghana, and South Africa. By contrast, in a number of countries, such as Pakistan, Nepal, Israel, and Ethiopia, soldiers outnumber health workers 10 to 1.

The cost of keeping three US Nimitz aircraft carriers at sea for 1 year is greater than the combined investment of all industrial-

ized nations in family planning programs for the third world. It is not appropriate in a chapter on family planning to ask whether such weapons make the world safer or more dangerous, but it is relevant to provide cost comparisons: spending more money on family planning is not going to make or break donor nations. The cash flow from rich to poor countries in the late 1980s is \$65 billion yr, or \$17 per capita, of which only 14 cents currently goes to family planning. Currently, the United States spends only slightly more than 10 cents per capita per year of federal money on contraceptive research and development, and the United States is now in the paradoxical position that it may end the twentieth century with fewer contraceptive choices than were available in 1900.

Conclusion

The need to control human numbers has partially faded from political and even scientific view. In reality, the 1990s are the most challenging time in the history of family planning. The work that is done in the next decade will determine the welfare of our planet in the twenty-first century and perhaps for the next several thousand years. The so-called "low" projection for world population by the United Nations is for 8.4 billion people by the year 2050, and the "high" projection is for 12.4 billion for that date. Which of these two numbers is achieved will largely depend upon the vigor with which birth control initiatives are pursued now.

The 1990s have to be the most exciting and the most important in the history of family planning. If we could double contraceptive prevalence at a global level in the 1990s, we might keep the world population at 10 billion or less (Fig. 2). In other words, action taken in the next decade can bring about a difference in the level at which global population stabilizes in an amount equal to the total world population only 10 years ago.

The experience of China emphasizes the critical choices we all face. The Chinese would be the first to recognize that the one-child policy is the most difficult piece of social engineering they have attempted. The tragedy is that those women who are bullied by the community to have an abortion they do not want are the children of women who as recently as the 1960s could not obtain the voluntary sterilizations and abortions that they did want. The Chinese know that they live in a country the same size as the United States but with 1 billion people, and even if the majority of this generation have only one child, the population will still grow by over 200 million—approximately equal to the current population of the United States, Egypt, Mexico, Nigeria, and many other countries are moving too slowly in making family planning available in this generation and may find themselves being forced to abrogate that most precious and intimate of human freedoms—the freedom to choose the size of our families—in the next generation.

Currently available methods of contraception are not as good as they would have been if an appropriate amount of investment had been put into this important area of medical research. There is no way that 5 billion people are going to reach their fertility goals merely through the availability of natural family planning or even pills and condoms. Human fertility has been successfully controlled in a number of different societies and against a variety of socioeconomic backgrounds, using the somewhat clumsy and limited methods we have available, but only at a high cost and/or with a high level of abortion and sterilization.

Ethically and politically, human fertility regulation has been almost totally misunderstood. Theologians of all religions have tended to focus on the drama of human copulation and to have lost sight of those lifelong cycles of human fertility, which actually determine the welfare of women and

children. Once society accepted the technology of artificial formula, glass feeding bottles, and rubber nipples to nourish newborn infants, then it had no alternative but to accept contraception and rubber condoms to restore the balance of nature and the natural spacing of pregnancies that evolution had given our species. Politically, countries rich and poor have tried to do family planning on the cheap. The choice facing Western policymakers at the present time is either to vastly increase the resources going into research and services using reversible methods of contraception or to settle for the present compromise where inadequate methods have to be backed up with abortion and sterilization.

The fragile biosphere of our planet cannot survive the present growth in human numbers for too long. Countries, both rich and poor, must understand the choices that face them and act on those choices quickly.

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