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the current level of about \$30 million—an additional \$23 million to be invested annually—could be used productively to accelerate progress on methods now under development.

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Summary

The availability of modern birth control methods has wrought a veritable contraceptive revolution in both developed and developing countries over the past two decades. But concerns about safety, expensive litigation in the United States, and diverse and changing life-styles have all left the current array of contraceptives grossly inadequate to meet growing worldwide needs. Steroid implants and improved injectables, IUDs, barrier methods and sterilization devices should be widely available in the next few years. But the long-soughtafter radically new methods that will constitute the next contraceptive revolution-like vaccines, a male contraceptive and a oncea-month pill-will not be developed in the foreseeable future without a massive infusion of new funds. The eight contraceptive research and development (R&D) programs that are responsible for more than half of all current product development efforts now spend about \$30 million a year on contraceptive research. With an additional \$23 million annually, they could considerably accelerate current research efforts and begin new ones on products that have become possible only as the result of recent scientific discoveries. Even this level of investment-representing a 75 percent increase over current expenditures by the eight groups-is unlikely to be sufficient to make optimum progress in the development of radically new methods. Since the pharmaceutical industry can no longer be depended upon to take the leading re-

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search role that it performed 20 years ago, current public-sector R&D organizations may need to expand their efforts to include most aspects of the contraceptive development and introduction process, and new dedicated R&D centers will probably have to be established.

However, current donors to contraceptive R&D-mainly the U.S. and other developed-country governments-are not yet sufficiently convinced of the grave social and health consequences of unintended pregnancies in their own countries, or of the worldwide adverse social and economic effects of high rates of population growth in the Third World, to provide the level and the pace of funding that are needed. Some kind of donor consortium, such as those that achieved such spectacular success in agricultural and tropical disease researchbacked up by a similar political and public consensus-is needed, and needed soon, if the next contraceptive revolution is to become a reality.

## Introduction

The introduction over the past 25 years of the pill, the IUD and simplified techniques of sterilization has been aptly characterized as creating a contraceptive revolution. In the United States and other developed countries, the availability of these methods, backed up by legal and safe abortions, has permitted women to transcend a destiny traditionally dominated by biology. With the assistance of birth control methods that have become much more certain and easier to use, birthrates in the United States and other industrialized countries have plummeted to levels at or below those required for generational replacement. In many developing countries, rates of population growth have fallen substantially, and national family planning programs have helped reduce traditional differentials in birthrates based on socioeconomic status and urban or rural residence. Changes on such a scale and at so rapid a pace would probably not have been feasible without modern methods of contraception. The availability of reliable birth control methods has also been important for the economic improvement of individual families and for the social and economic development of nations.

Existing methods of contraception represent great improvements over what was available before the 1960s. They are, nevertheless, inadequate to meet all of the current and projected needs of couples in the United States, in other developed countries and, especially, in the Third World.

In the United States, for example, more than half of all pregnancies are unintended; among teenagers, that proportion is more than 80 percent. Teenage birthrates in the United States are higher than those of all other developed countries except Hungary. Contraceptive sterilization rates are extraordinarily high; half of all female sterilizations occur when the woman is under age 30, and 20 percent when she is under 25.4 Early sterilizations are sometimes the desperate resort of young people who were unable to use reversible contraceptive methods effectively when they were teenagers.

In almost all countries of the developing world, World Fertility and Contraceptive Prevalence Surveys show that more than half of women want to stop having children or wish to postpone their next birth, but only a small proportion of these are currently practicing contraception.5 There are about 1.2 billion women of reproductive age worldwide. By the turn of the century, as today's developing-world children reach the reproductive ages, that number is expected to swell by nearly 400 million to 1.6 billion.6 Very high rates of maternal and infant mortality and morbidity in many developing countries are attributable to illegal abortions, to births too closely spaced and to childbearing at very young or older ages.7

The contraceptive methods now available to individuals of reproductive age are far su-