



Bixby Center
for Global
Reproductive
Health



University of California
San Francisco

Enhancing sexual & reproductive health & rights with contraceptive research & development



The UCSF **Bixby Center for Global Reproductive Health** aims to promote reproductive health, contraceptive access, and the prevention of sexually transmitted infections (STIs) worldwide through research, evaluation, training, and policy analysis. The Bixby Center is also a leader in providing abortion care, training and policy analysis in the United States and abroad.

There is much to celebrate about the successes of modern family planning. Women all over the world are having smaller, healthier and more prosperous families, thanks in part to increased access to safe and effective contraception. Globally, women's sexual and reproductive health has improved drastically in the last 50 years, but the contraceptive revolution remains unfinished.

At the 2012 London Family Planning Summit, national leaders, multilateral and bilateral donors committed to expand access to family planning services. Expanding access is critical to reaching global health, development and human rights goals—but ***to meet the needs of all women, we must reinvigorate contraceptive research and development*** (R&D). The United States Institute of Medicine confirms that we should prioritize providing “a broader, safer, more effective array of options.”ⁱ

What is at stake?

Access to high quality family planning goods and services is a crucial component of human rights and development. Use of voluntary family planning allows women to:

- avoid early and unwanted pregnancies,
- reduce mother-to-child transmission of HIV,
- space their children, improving the odds that each child will survive to her or his 5th birthday,
- and reach their educational and occupational goals.

Changes like these in individual families result in ***population-level decreases in maternal and infant mortality***, and helps whole societies to emerge from poverty.ⁱⁱ

The unfinished revolution

Use of contraception in less developed countries has increased dramatically since 1960, from 9 percent (30 million users) to 59 percent (645 million users). The average number of children per woman declined by more than half, from 6.0 to 2.6. Even so, an estimated **222 million women have an unmet need** for modern contraception.ⁱⁱⁱ

Unwanted and mistimed pregnancies remain a critical problem, with over 40% of developing country pregnancies unintended.³ These **80 million unintended pregnancies** account for a substantial portion of unsafe abortions, maternal and infant mortality.

We have learned from successful family planning programs—such as in Matlab, Bangladesh—that the total number of contraceptive users increases each time a new method becomes available.^{iv} A large array of contraceptive methods **improves program quality** and increases the odds of any potential user finding an acceptable method.^v

Aren't today's contraceptives good enough?

Data from the Demographic and Health Surveys in 36 developing countries show that side effects and health concerns limit women's use of currently available contraceptives.^{vi} Between 20 - 50 percent of married women at risk of unintended pregnancy do not use contraception because of side effects, health concerns, or inconvenience. From **one-fourth to one-half of women had stopped using a contraceptive** because they experienced or feared side effects or adverse health consequences.^{vii} Low continuation rates for methods in many settings attest to women's dissatisfaction with available contraceptives.

In addition to these limitations, clear evidence shows that most contraceptives are **not as effective in the real world as they are in clinical trials**. In typical use, only the contraceptive implant and intrauterine device are highly effective reversible methods—but they require a highly skilled healthcare provider for placement and removal, are not user-controlled, and are often prohibitively expensive. When considering what contraceptive to use, women rate a method's effectiveness as a key criterion^{viii}, but this criterion

simply cannot be met with existing technologies in many low resource settings.

How can we do better?

Research has identified a number unfilled contraceptive niches; developing products in these niches will help reduce unmet need. Characteristics that women consider desirable include:

- **Methods that do not require partner participation or knowledge.** Opposition from partners, family members, and others is cited as the reason for not using a contraceptive by about one in ten women in developing countries.³ The only reversible methods that can be used in full privacy now are the injectable hormonal contraceptives.
- **User-controlled, long-acting methods.** Current long-acting methods require a highly skilled healthcare provider for initiation and removal.
- **Methods that can be used on demand around the time of intercourse** (peri-coital). About one in five women report having sex infrequently, and choose not to use contraception continuously.⁷
- **Non-hormonal methods** for women who dislike or are concerned about the side effects of hormonal methods.
- **Multi-purpose prevention technologies (MPTs)** that simultaneously protect against unintended pregnancy and sexually transmitted infections such as HIV. Condoms are the only currently available MPT.
- **New male contraceptives.** Globally, one-third of contraceptive use is by men. But the only highly effective method available to men—vasectomy—is not reversible.
- **Non-surgical methods of sterilization.** For couples who have completed their family, sterilization is popular worldwide. Even minimally invasive surgical sterilization techniques carry associated risks of infection and complication. Non-surgical alternatives would allow safe access.

We must also assure that new methods are suitable for delivery in low-resource settings, and that they are affordable.

Is there a robust pipeline for new contraceptives?

New contraceptive methods that fill these niches are in the contraceptive R&D pipeline: a review by the Bill

and Melinda Gates Foundation in 2011 found **over 100 new contraceptive methods at various stages of development**. The majority are being investigated by non-profit and university researchers. Most of these methods have languished due to limited funding. Support for early phase and translational contraceptive R&D is provided by only a few organizations in Europe and the United States, and totals less than USD \$85 million per year. Adjusted for inflation, this is *\$39 million less than 1980*,^{ix} and is dwarfed by annual R&D funding for tuberculosis (\$550 million) and HIV/AIDS (\$1.2 billion).

Public & philanthropic funding for contraceptive R&D is effective

Although investments in contraceptive R&D have declined, we know from past experience that public and philanthropic contraceptive R&D funds have been successful.^x Of the contraceptives that meet European and United States standards for marketing, **the majority were developed with public funding at universities and non-profit organizations, or with philanthropic support**:

- The original birth control pill became available after support from philanthropists, and a new IUD under development by Medicines360 will follow suit.
- The Mirena and ParaGard IUDs, Ella emergency contraception, and the contraceptive vaginal ring were all developed with EU and US public funding.
- The first implantable contraceptive Norplant, the female condom, and the new SILCS diaphragm were all developed with philanthropic and public funding.
- The injectable contraceptive Depo Provera was developed with private funding, but important studies that allowed it to be marketed were carried out with public funding by the World Health Organization.

The public sector has a great track record for contraceptive R&D. The public sector is also able to conduct R&D at approximately one-tenth the cost of private pharmaceutical companies. With mergers and new management at large pharmaceutical companies in the last decade, none of these companies have active contraceptive R&D programs. The time is right for EU and US governments to reinvigorate their commitment to leadership in this field, and reap the benefits in maternal and child health globally.

Recommendations

An additional investment of **\$75 million annually would allow exploration of many of the promising contraceptive leads** now in the pipeline. The organizations below can constructively use additional funding immediately to speed the introduction of methods they have developed.

Organization	Examples of methods under development
The Population Council and the International Center for Contraception Research (ICCR)	A non-hormonal vaginal ring, a user-controlled and long-acting vaginal ring, male contraceptives
UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction	Male contraceptives
CONRAD	Multi-purpose prevention technologies (MPTs) such as the tenofovir and progestin vaginal ring
PATH	MPTs such as a new female condom and the SILCS diaphragm
Medicines360	An affordable levorgestrel-releasing intrauterine device

For Additional Information

The UCSF Bixby Center for Global Reproductive Health's Contraceptive R&D Advocacy project is supported by the Bill and Melinda Gates Foundation. For more information, please contact:

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- i Harrison PF, Rosenfield A (Eds). Institute of Medicine. Contraceptive Research and Development: Looking to the Future. Washington, DC: National Academy Press, 1996.
 - ii Tsui AO, McDonald-Mosley R, Burke AE. Family planning and the burden of unintended pregnancies. *Epidemiol Rev* 32(1):152-74; 2010.
 - iii Singh S, Darroch JE. Adding it Up: Costs and Benefits of Contraceptive Services—Estimates for 2012. New York: Guttmacher Institute and United Nations Population Fund (UNFPA), 2012.
 - iv Phillips JF, Simmons R, Koenig MA, Chakraborty J. Determinants of reproductive changes in a traditional society: Evidence from Matlab, Bangladesh. *Stud Fam Plann* 19(6):313-334; 1988.
 - v Jain AK. Fertility reduction and the quality of family planning services. *Stud Fam Plann* 20:1-15; 1989.
 - vi Darroch JE, Sedgh G, Ball H. Contraceptive Technologies: Responding to Women's Needs. New York: Guttmacher Institute, 2011.
 - vii Sedgh G, Hussain R, Bankole A, Singh S. Women with an unmet need for contraception in developing countries and their reasons for not using a method. Occasional Report No. 37. New York: Guttmacher Institute, 2007.
 - viii Lessard LN, Karasek D, Ma S, et al. Contraceptive features preferred by women at high risk of unintended pregnancy. *Perspect Sex Reprod Health* 44(3): 194-200; 2012.
 - ix Atkinson LE, Lincoln R, Forrest JD. Worldwide trends in funding for contraceptive research and evaluation. *Fam Plann Perspect* 17(5): 196-207; 1985.
 - x Duncan GW. External Review of USAID's Current and Future Role in Contraceptive Research and Development, October 5, 2006. Revised version issued February 14, 2007.



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