A new sex and HIV curriculum—developed by the Population Council and several partner organizations and published by the Council—emphasizes dignity and rights. See story, page 3.

INSIDE

- Sperm Structure Acts as Protein Gate ................................................................. 2
- Integrating Gender and Rights into Sex and HIV Education ...................................... 3
- Best Practices for Expanding Access to Emergency Contraception .......................... 4
- Recent Publications ............................................................................................... 7
- Studies Explore the Sexual Health Needs of HIV-Positive Adolescents .................. 8
Sperm Structure Acts as Protein Gate

Molecular biologist Gary Hunnicutt and his research team have made an important discovery (reported in the April issue of *Biology of Reproduction*), relating to a structure on the sperm cell called the annulus; this finding may lay the groundwork for a reversible male contraceptive.

Sperm cells have a long journey through a host of biological environments. Sperm are formed in the testicles, develop further in the epididymis, pass through the urethra, into the woman’s vagina, through the cervical canal and the uterine cavity, and finally into the fallopian tubes to fertilize an egg. When they begin this journey in the testicles, they are infertile. They undergo a transformation in the epididymis that enables them to eventually fertilize an egg.

Hunnicutt, who was at the Population Council when he conducted his research and is now at the U.S. National Institutes of Health, focused much of his investigations on the annulus, a ring-like structure located between the midpiece and principal piece of the sperm tail (see illustration). Previously, Hunnicutt had discovered that sperm lacking an annulus have bent and defective tails. In this latest research, Hunnicutt and his team, including the Population Council’s Susanna Kwitny, found that the annulus regulates the movement of proteins on the surface of the sperm.

These proteins may be the key factor that enables sperm to function in so many environments. “Most cells are able to make new proteins to survive in different conditions,” says Hunnicutt, “but sperm don’t make new proteins.” Instead, sperm appear to alter their activity by rearranging the protein and lipid molecules on their surfaces.

This rearrangement of molecules may be controlled by barriers that compartmentalize proteins and lipids at different locations in the sperm. The annulus has been thought to act as a gatekeeper that separates two areas of the sperm tail. When the sperm needs to alter its function, the annulus may selectively allow certain proteins or lipids on one side to move and thus reach a new region of the sperm tail. Once these proteins and lipids have moved into this new area, they can react with the molecules there. This can trigger new chemical reactions that cause sperm to modify their function.

### The investigation

The research team began by examining photographs of sperm taken by previous researchers using a technique called freeze-fracture electron microscopy. This method is useful for examining cell membranes and proteins embedded in them. “We looked at these old images with a new eye,” said Hunnicutt. “We discovered that there is a dense array of membrane proteins located directly over the annulus and mirroring its structure. We think these proteins may be supported by the annulus and may represent a barrier to the movement of other membrane proteins on the sperm.”

The researchers chose to investigate the protein basigin, which is found in the principal piece of the sperm tail until the developing sperm passes through a testicular structure known as the epididymis. Once through the epididymis, basigin can be found in the midpiece of the sperm tail. In both locations, basigin moves freely within its domain. The researchers wanted to track a protein that moves freely because proteins that do not move freely may be anchored in place, rather than confined by a “gate.”

“If the annulus is generating this protein fence, as we suspect, then in sperm that lack an annulus, you should find basigin distributed outside of the principal piece of the sperm tail,” explained Hunnicutt. “This is exactly what we found.”

But Hunnicutt and his team were surprised to find much less basigin in the annulus-free sperm than they expected. Further research revealed that the protein was being lost because it was not being confined to the principal piece of the tail. As sperm pass through the epididymis, pieces of excess membrane in the midpiece of the tail (including any basigin residing there) get pinched off and discarded as the sperm streamlines. When basigin is sequestered behind the annulus, it avoids being shed during this streamlining process. It is likely that in annulus-free sperm, proteins besides basigin are also lost in the streamlining process. This loss of crucial proteins may account for the fact that sperm that lack an annulus are infertile.

### Path to a new male contraceptive?

“Whatever allows the gate in the annulus’s fence to open is what we want to discover next. Manipulating that gate could be a target for a novel male contraceptive.” Such a contraceptive would not interfere with the male endocrine system and would therefore be unlikely to have the side effects associated with potential male hormonal contraceptives.

### SOURCE


### OUTSIDE FUNDING

U.S. National Institutes of Health
Integrating Gender and Rights into Sex and HIV Education

“Our field needs to do a better job at sex and HIV education,” says Population Council social scientist Nicole Haberland. “Very few curricula actually demonstrate that they can have an effect on unintended pregnancy or on sexually transmitted infections. We see stronger results with those few curricula that emphasize gender and power issues.” Hence, policymakers and international organizations have requested help in educating young people about sex, HIV, and family life in a way that is gender-equitable and rights-based.

A new two-volume kit—developed by the Population Council and several partner organizations and published by the Council—responds to that call. The kit, titled It's All One Curriculum: Guidelines and Activities for a Unified Approach to Sexuality, Gender, HIV, and Human Rights Education, draws on research findings about the factors (such as gender norms) that drive sexual behavior. It also reflects international agreements calling for sexuality education and gender equality.

“Several education policymakers have told us that the kit’s emphasis on dignity and rights will be politically more acceptable than a narrower emphasis on sexuality,” says Haberland, who edited the volumes along with Council consultant Deborah Rogow.

It’s All One Curriculum was developed by an international working group of seven organizations—CREA, Girls Power Initiative, International Planned Parenthood Federation, IPPF/Western Hemisphere Region, International Women’s Health Coalition, Mexfam, and Population Council. Review and testing of activities involved close to 100 experts worldwide. These specialists worked to ensure that the kit’s perspective and content are relevant and appropriate for educating young people globally: from Africa to the Pacific, from Asia to the Americas, and from Europe to the Arab World.

Volume 1 of the kit has eight content units, each with learning objectives and key information. The first two units cover human rights and gender. These issues inform the following units, which cover sexuality; relationships; communication; the body; and sexual and reproductive health, including HIV and contraception—all with a strong gender perspective. A final advocacy unit helps students make a small difference in their own communities. The content in Volume 1 is supplemented by reflection questions in the margins, 22 fact sheets, and by 54 participatory activities compiled in Volume 2. Spanish and French versions of the kit are nearing publication.

“The kit was designed as a flexible resource, so that curriculum developers in diverse settings can easily understand the content and extract the level of detail they need to meet their local goals. Early feedback we have received is that it succeeds in that aim,” says Rogow.

Improving adolescents’ lives

Educators can use this resource to help their programs increase adolescents’:

- ability to make responsible decisions and act upon their own choices;
- ability to participate in society and exercise their human rights;
- critical thinking and overall educational achievement;
- sense of control over their lives; and
- sense of sexual well-being and enjoyment.

It’s All One Curriculum also aims to reduce adolescents’ rates of:

- unintended pregnancy;
- sexually transmitted infections, including HIV; and
- gender-based violence, including coerced or unwanted sex.

Who can use the kit?

It's All One Curriculum is designed primarily for curriculum developers, school teachers, and community educators who are responsible for education in the areas of sexuality/sexual health (including HIV and AIDS) and civics or social studies. Users may draw on the guidelines and activities in this kit in many ways. They can develop or modify comprehensive curricula appropriate for their setting. They can design more narrowly focused teaching units (for example, on gender or sexual health). And they can use the kit as a resource for interactive and single-topic lesson plans—for example, gender and the media, pressures on boys to prove their masculinity, girls’ ability to move safely around the community, child marriage, transactional sex, bodily autonomy, or disclosing one’s HIV status.

These lesson plans involve students in a range of activities, including study, reflection, discussion, debate, and analysis. These methods reinforce students’ advanced thinking skills and foster their connectedness to school. As such, schools can use It’s All One Curriculum to help strengthen education overall.

“It is crucial to put sexual activity and sexual decisionmaking in the context of rights,” says Population Council senior policy analyst Judith Bruce. “We need to move away from the ‘medical model’ and encourage adolescents to understand and exercise their rights. This work tries to increase critical thinking about an important sector of life, rather than present a rulebook, or worse yet a purely technical instrument. Together with its collaborators, the Council has presented a new model for sex education.”

It’s All One Curriculum is available in English in PDF and in hard copy from the Population Council. Spanish and French translations will be available later this year. To download or request a hard copy, go to: http://www.itsallone.org

SOURCE


OUTSIDE FUNDING

Best Practices for Expanding Access to Emergency Contraception

Since its founding in 1952, the Population Council has been dedicated to expanding contraceptive choice for women and men around the world. In the past decade the Council has been instrumental in bringing emergency contraceptive pills into the mainstream in many countries of Africa, Asia, and Latin America, including Bangladesh, Mexico, and most recently in Kenya. A new publication, the ECP Handbook: Introducing and Mainstreaming the Provision of Emergency Contraceptive Pills in Developing Countries, details best practices that have emerged from the Council’s work. The handbook, written and edited by Council staff members from Bangladesh, India, Kenya, Mexico, and elsewhere, provides much-needed step-by-step guidance on making emergency contraceptive pills an integral and readily available service within national reproductive health programs. Production of the handbook was a collaboration between two projects of the Population Council’s reproductive health program: the Frontiers in Reproductive Health project and the ECafrique Network.

Emergency contraceptive pills

Unlike any other family planning method, emergency contraceptive pills (ECPs) enable women to prevent unplanned pregnancy after unprotected intercourse, rape, or contraceptive failure (such as condom breakage). They are safe to use and can prevent pregnancy up to 120 hours after unprotected intercourse. The sooner ECPs are taken, the more effective they are. However, they are not as effective as other modern contraceptive methods and are not recommended for regular use. ECPs are formulated with the hormone progestin alone or with estrogen and progestin combined. Progestin-only ECPs are more effective than ECPs containing estrogen and progestin. When a woman is already pregnant, ECPs do not affect the pregnancy and will not disturb embryo development.

Research has shown that progestin-only ECPs—the more common type—work by delaying or preventing the release of an egg from the ovary. There is some evidence that they may interfere with the sperm’s ability to reach the egg, but this evidence is not strong. Studies have shown that progestin-only ECPs do not disrupt events or processes, such as implantation, that occur after fertilization. Knowledge of how ECPs work is central to understanding the crucial difference between emergency contraception and early medical abortion. Confusion between the two has sometimes led to unjustified rejection or denouncement of ECPs.

Addressing specific needs

Any woman can experience an unplanned pregnancy. However, women in certain circumstances are more vulnerable. For these women, ECPs can play an especially important role. The handbook has a special section on how best to meet the needs of rape survivors, young women, and women enduring humanitarian emergencies.

The narrow time frame in which ECPs are effective necessitates that ECP information and services be provided at the first point of contact with a rape survivor. This can be at a health facility, a specialized rape care center, a pharmacy, or another facility at which staff have been trained to safely provide ECPs, such as a police station or women’s refuge. Establishing ECP services at locations likely to be the first point of contact for rape survivors requires staff training and ensuring a continuous supply of ECPs to avoid stockouts. The Council strongly recommends that in the case of rape ECPs be provided at these locations, rather than referring women to another location, because of the critical need for immediate use. Council research in Zambia, for example, has demonstrated that ECPs can be safely and effectively provided by trained police officers.

Many young women experience infrequent, unplanned, or non-consensual sexual activity. Thus, they make up a large proportion of women needing emergency contraception. Information and services for this group of women should be made available in the same locations as other youth reproductive health information and services. Because young women, particularly adolescents, may feel shy, distrust services, lack money, and have limited information, care must be paid to ensure that ECP services are easily accessible, respectful of privacy, and reasonably priced.

ECPs should be available from the beginning of a response to a humanitarian crisis. The World Health Organization’s Inter-Agency Working Group for Reproductive Health in Refugee Situations has developed a Minimum Initial Service Package to address the reproductive health needs of displaced women and girls. This package includes ECPs as one of the services to be provided. The WHO has also included ECPs in its “New Emergency Health Kit,” a package of basic commodities delivered immediately to every newly identified emergency site.

Introducing ECPs

The ECP Handbook describes how the Population Council and partner organizations overcame obstacles to the introduction of ECPs in a variety of countries and details five key steps for
introducing and mainstreaming ECPs within national reproductive health programs:
- registering a dedicated ECP product,
- introducing ECPs into the public sector and NGOs,
- training and building the capacity of ECP providers,
- promoting and raising public awareness of ECPs, and
- making ECP services widespread and sustainable.

**Efforts in Kenya**

In 2006, the Council began a collaboration to improve Kenyan women’s access to ECPs and ensure that adequate information is provided to all users. Kenya’s Ministry of Public Health and Sanitation, the Population Council, and Population Services International (PSI) collaborated for three years to mainstream emergency contraception. This work was described in a final report on the project.

The initiative included a national awareness-raising campaign, technical assistance to the Kenyan Division of Reproductive Health to build capacity and ensure supply sustainability, and efforts to improve ECP services in private-sector pharmacies, including referring ECP users to other reproductive health services, such as long-term family planning and voluntary HIV counseling and testing.

Awareness and use of ECPs increased dramatically over the course of the campaign. According to the 2008-09 Kenya Demographic and Health Survey, 42 percent of women of reproductive age had ever heard of EC, up from only 24 percent in the 2003 survey. In the 2008-09 survey, 1.7 percent of women of reproductive age had ever used EC, up from 0.9 percent in 2003.

Private-sector pharmacies dominate ECP provision in Kenya, and research conducted under the initiative by PSI found that as many as 94 percent of users obtained ECPs from these outlets. Kenyan women report that they prefer pharmacies because they are convenient, quick, and confidential.

Despite media reports to the contrary, Population Council research indicates that the vast majority of Kenyan women who buy ECPs are educated and employed. Results of a client intercept study conducted in urban pharmacies found that 72 percent of users were between the ages of 20 and 29, 61 percent were currently employed, and 61 percent had a college/university-level education. (Separate Population Council research in Bangladesh and India similarly showed that adult women, not adolescent girls, are the primary users of emergency contraception.)

While awareness of emergency contraception has increased in Kenya, more education is clearly needed. The study showed that repeat users of ECPs are less informed than other users about the method. Nearly 60 percent incorrectly believed that ECPs are 100 percent effective.

Based on the success of this initiative, the Population Council is continuing to support efforts by the Kenyan Division of Reproductive Health (DRH) to sustain and institutionalize the improvements made. In June 2010, the DRH conducted a national dissemination meeting to publicize the results of the initiative, which included high-level representation from all provinces and attracted substantial media attention. Efforts to raise public awareness and correct misperceptions about ECPs are continuing through engagement with the media, incorporation of ECP messages into the National Communication Strategy, and partnerships with professional associations to educate their members on proper ECP provision. The Council is also working with interested partners elsewhere in Africa to ensure that the Kenyan experience serves as a model for those wishing to expand access to ECPs in their countries.

The Population Council’s experience shows that it is possible to strengthen ECP services in both the public and private sectors while also raising public awareness, knowledge, and use of the method. Provision of ECPs is not exclusively the responsibility of government family planning programs. Access can be greatly enhanced by developing links with private-sector providers and pharmacies, the HIV and AIDS sector, and sexual assault services.

**Sources**


**Outsourcing Funding**

William and Flora Hewlett Foundation and US Agency for International Development
of Uganda (Kampala, Wakiso, Masaka, and Jinja) who were perinatally infected with HIV. Later, as part of the USAID-funded APHIA II Operations Research project, the Council collaborated with FHI, Pathfinder International, and the Kenya National AIDS and STI Control Programme to survey 455 Kenyan adolescents aged 15 to 19 years who are living with HIV.

Both studies found that these young people are sexually active. Fifty percent of the Ugandans interviewed and 40 percent of the Kenyans were currently in a relationship. A third of the Ugandans (51 percent of females and 37 percent of males) and more than half of the Kenyans (60 percent of females and 44 percent of males) reported having had sexual intercourse. Forty-four percent of Ugandans and Kenyans who were not sexually active wanted to have sex. In both countries, a large proportion of those surveyed saw no reason why someone living with HIV should not have sex.

However, among those who had engaged in sex, only 37 percent of Ugandans reported using a male or female condom to prevent infection or re-infection the first time they had sex. Among the Kenyans surveyed the figure was only 20 percent.

The young people in both countries expressed a strong desire to have children. Forty-one percent of the sexually active HIV-positive girls surveyed in Uganda and two-thirds of those in Kenya had been pregnant. In Uganda, 86 percent of those who did not have children intend to do so later in life. In Kenya, the figure is almost 80 percent.

In both countries, young people living with HIV feel more comfortable discussing sexuality with service providers or counselors than with a parent or guardian. Also in both countries, the young people’s greatest fears involve telling others about their HIV status, having others find out, infecting someone else with HIV, getting pregnant, or getting someone else pregnant.

“Our research exposes a disconnect between the information and advice that service providers give to HIV-positive young people and their actual needs and desires, as well as between the adolescents’ fears and their actual preventive practices,” says Population Council social scientist Francis Obare.

**Programming and policy recommendations**

On the basis of the studies in Uganda and Kenya, the Population Council and its collaborators have developed several recommendations for improving policies and programs for this unique population. There is a demonstrable need to strengthen HIV-prevention services. HIV-positive young people have the same desire to engage in sex as other adolescents. They need to be provided with adequate information, services, and condoms. Further, effective services to prevent the transmission of HIV from mother to child are essential for this group of young people, who are at a high risk for unplanned pregnancy.

**Is it realistic to advise young people living with HIV to avoid sex altogether?**

Support services need to be updated to provide HIV-positive adolescents with balanced counseling. Rather than providing only warnings about the potentially adverse outcomes of sex, they should provide practical information, guidance, and support. Programs should also develop and test ways of involving parents and guardians in discussions about sexuality with their children.

Support groups for people living with HIV are a source of peer and psychosocial support as well as life skills training. Leaders of these groups need help to ensure the groups are sustainable and to make them responsive to the needs of their members. Life skills training, provided through support groups and elsewhere, needs to be improved. Such training can enable young people with HIV to make informed choices, balance responsibility with sexual and reproductive health desires, and realize their potential in life.

**Shaping policy**

In May 2010, the Population Council participated in a global consultation, held in Kampala, Uganda, on adolescents living with HIV. The meeting was organized by UNICEF, the World Health Organization, and the Global Network of People Living with HIV. The Council’s work was extensively cited and used to formulate guidelines to improve services and better respond to the needs of adolescents living with HIV. Additionally, UNESCO has used the Council’s findings on the needs of HIV-positive young people in school in its HIV and AIDS programming and policy review.

“Rather than insisting on abstinence, programs for adolescents with HIV must acknowledge their real needs,” says Birungi. “They should teach them what they need to know to make healthy decisions, and emphasize disclosing HIV status to partners as well as using condoms consistently.”

**SOURCES**


**OUTSIDE FUNDING**

Ford Foundation and US Agency for International Development
HIV AND AIDS


Boon, Hermien, Shes James, Robert A.C. Ruiter, Bart van den Borne, Eka Ewu-Williams, and Priscilla Reddy. “Explaining perceived ability among older people to provide care as a result of HIV and AIDS in South Africa,” AIDS Care 22(4): 399–408.


Saggurti, Niranjani and Alankar Malviya. 2009. “HIV transmission in intimate partner relationships in India.” New Delhi: UNAIDS.


POVERTY, GENDER, AND YOUTH


intimate partner violence and syphilis among pregnant women in Bolivia,” *Journal of Women’s Health* 18(12): 2077–2086.


Hu, Guo-Xin, Guo-Rong Chen, Xu Hui, Renshan Ge, and Jing Lin. “Activation of the AMP activated protein kinase by short-chain fatty acids is the main mechanism underlying the beneficial effect of a high fiber diet on the metabolic syndrome,” *Medical Hypotheses* 74(1): 123–126.

Hu, Guo-Xin, Qing-Quan Lian, Bing-Bing Chen, Pramod V. Prasad, Narender Kumar, Zhi-Qiang Zheng, and Renshan Ge. “7-hydroxysteroid dehydrogenase 1 in rat Leydig cells,” *Endocrinology* 151(2): 746–754.


**OTHER PUBLICATIONS**


Population Council Annual Report 2009

Population and Development Review 35(4), 36(1), and 36(2)

Studies in Family Planning 40(4), 41(1), and 41(2)
The rapid roll-out of antiretroviral treatment programs has made it possible for people infected with HIV at birth to live into adolescence and adulthood. These young people often have been receiving HIV treatment all their lives. They may be ready for dating and sexual relationships, but there are very few programs that help them do this safely and address their special health needs.

The majority of HIV and AIDS support programs are aimed at either young children or adults. Since 2006, the Population Council has pioneered research—first in Uganda and then in Kenya—to explore the sexual and reproductive health needs of young people aged 10 to 19 who are infected with HIV. The Council has used the findings from these ground-breaking studies to collaborate with local partners, ministries of health, and international agencies. We are helping to develop and test healthy and positive approaches to sexuality and reproductive health within HIV and AIDS programs for adolescents living with HIV.

The lives of HIV-positive adolescents

Programs for the care, treatment, and support of people living with HIV and AIDS often counsel HIV-infected adolescents to avoid sexual relationships. But is this fair or even realistic advice? Before the Population Council began surveying young Ugandans and Kenyans who were infected with HIV at birth (also known as perinatally infected), very little was known about their reproductive health and sexuality. “With this research, the Council aims to better understand the sexual desires, experiences, beliefs, values, and practices of these young people, as well as their fears,” says Population Council social scientist Harriet Birungi, lead researcher on these studies. “With this knowledge we can help tailor programs to the unique needs of these young people.”

The Population Council’s USAID-funded Frontiers in Reproductive Health program began by collaborating with the AIDS Support Organization (TASO) to survey 732 young men and women aged 15 to 19 years in four districts.