TRANSITIONS TO ADULTHOOD

Globalization Is Transforming Adolescence in the Developing World

The largest-ever generation of people aged 10–24 is now making the transition from childhood to adulthood. One and a half billion of them—86 percent—live in developing countries. Adolescence is a pivotal stage of physical, emotional, cognitive, social, and economic transitions, often characterized—particularly for girls—by lack of autonomy. The nature and quality of young people's adult lives, as well as a country's social and economic development, depend on how successfully they navigate this critical period.

More than three years ago, the U.S. National Academies asked Cynthia B. Lloyd, Population Council director of social science research, to lead an expert panel in examining transitions to adulthood in developing countries and outlining the policy implications of its findings. Two other Council senior social scientists, Shireen Jejeebhoy and Barbara Mensch, also participated on the 15-member panel, which focused particularly on the influence of gender. Population Council researchers have concentrated on the study of adolescents since the early 1990s, committed to moving the field of adolescent policy research from a narrow focus on sexuality and reproductive health to broader attention to social and economic issues that underpin adolescent health.

In 2005, the panel’s investigations culminated in the publication of Growing Up Global: The Changing Transitions to Adulthood in Developing Countries. The panel found that despite widespread progress in certain areas, many young people still lack good health and adequate schooling—both of which are essential for ensuring their productivity and well-being. The lives of many of these young men and women are profoundly different from those of their parents. While change itself is not new, the speed of globalization has accelerated and its scale has widened.

Substantial investments in the health and schooling of young people will equip them to participate constructively in shaping their own and their countries' future.

Health

Growing Up Global reports that, on average, this generation is healthier and has an improved chance of surviving to old age, compared to the same age group 20 years ago. But HIV/AIDS has had a hugely negative impact on young people, most notably in sub-Saharan Africa, where the disease is now the leading cause of death for 15–29-year-olds. More young women than young men die of AIDS in that region. “Young women, particularly the youngest adolescent girls, also face increased risk of death and disease related to first pregnancy, childbirth, and unsafe abortion,” elaborates Jejeebhoy. The panel concluded that unprotected sex is one of the riskiest behaviors that young people can undertake. Simultaneously, tobacco use is increasing throughout the developing world, and the gender gap in smoking prevalence is rapidly closing, with more young women taking up the practice. There is also evidence that illicit drug use among young people is rising, and alcohol use is expected to go up.

Schooling

The panel’s review of educational trends provides a revealing indication of the future because school is the most influential transforming agent in society after the family. The numbers show that young people in the developing world are now more likely than in the past to attend school during adolescence and postpone entering the labor force. But there remain large differences in school attendance rates according to wealth and residential status, with poor girls suffering particular disadvantage.

Although global trends in population, health, urbanization, and education have contributed positively to the demand for education,
Guide for Improving Adherence to Drug Therapies

Since 1996, the standard treatment for HIV infection has moved from single- and double-drug therapies to therapies containing three or more anti-HIV drugs, also known as Highly Active Antiretroviral Therapy, or HAART. One of the main concerns of antiretroviral programs is to motivate clients to follow their complex drug regimen exactly as prescribed. Unless the therapy is adhered to at least 95 percent correctly, levels of HIV in the blood will rise, resulting in AIDS-related complications.

To address this concern, the Population Council’s Horizons Program collaborated with the International Centre for Reproductive Health and the Coast Province General Hospital in Mombasa, Kenya, to create a manual for training health care workers in improving patient compliance with antiretroviral therapy. “This handbook is one of the first counseling training tools designed to increase adherence to HAART that has been developed in Africa,” says Horizons/Population Council researcher Avina Sarna, one of the handbook’s authors. The manual is being used in an intervention study in Kenya that is investigating ways of improving patients’ adherence to HAART.

Introducing antiretrovirals to Africa

Although 70 percent of individuals worldwide who are infected with HIV live in sub-Saharan Africa, antiretroviral treatment programs have only recently arrived there, and most are still on a small scale. Scarce financial resources and poor infrastructure have prevented broader introduction of HAART. But as the cost of the drugs drops, policymakers, public health officials, and international donors are launching new initiatives to bring antiretroviral treatment to more Africans living with HIV/AIDS.

Patients face significant challenges in following multi-drug antiretroviral therapies precisely. HAART is a life-long treatment. While first-line treatment regimens may be available in fixed-dose combinations where all medications are contained in one pill, second- and third-line regimens often consist of multiple medications that must be taken two to three times a day with varying dietary instructions. Antiretroviral medications also have side effects. Some of these are temporary, but others may last longer and their severity may compel a change of treatment. When patients fail to follow the regimen closely, virus becomes more prevalent in their bloodstream, killing their CD4 immune system cells. As a result, opportunistic infections appear, and health suffers. Additionally, if proper treatment protocols are not followed, the virus can mutate into drug-resistant strains.

Clients have shown weight gain and increases in CD4 immune system cell levels.

The manual consists of four training modules for health care workers, each of which takes approximately two hours to complete. The material covered in the workbook includes information on educating the patient about HIV and the HAART regimen, including potential side effects; assessing patient adherence to the protocol; and identifying and overcoming barriers to following the regimen. The manual uses various techniques to explore these topics: brainstorming, small group discussions, PowerPoint presentations, case studies, and role-playing.

The Mombasa HAART project, for which the training manual was devised, was initiated in 2003. It was designed as a learning site for similar service-delivery programs that are starting up in public-health facilities in Kenya and other African countries. The intervention compares two approaches to enhancing patient adherence to the HAART regimen. One arm of the intervention involves counseling patients, teaching them to use medication diaries and pill boxes, and encouraging them to enlist the help of sympathetic family and friends, among other strategies. The other arm uses all these approaches, but it additionally focuses on modified “directly observed therapy.”

Directly observed therapy (DOT) is a treatment strategy originally developed for tuberculosis patients, who must take all their medications consistently and on time for up to nine months to rid themselves of the infection. In the standard DOT approach, health workers or community volunteers literally watch clients as they take their medication.

“DOT has proven to be very effective in helping TB patients maintain their treatment schedules,” said Sarna. “One big difference between treatments for TB and HIV, though, is that antiretroviral medications for HIV/AIDS must be taken for life.”

A DOT strategy for AIDS treatment is called DAART, for “directly administered antiretroviral therapy.” A DAART program includes observation of patients taking their medications, but less often than for TB.

Although it is too early in the study to report findings about long-term adherence, clients in both arms who have completed four to six months of follow-up have shown weight gain and increases in the number of CD4 immune system cells that circulate in their blood. They have also experienced significant improvement in quality-of-life measures such as physical functioning, cognitive functioning, depression, and pain and energy levels.

SOURCE


OUTSIDE FUNDING

United States Agency for International Development

The Horizons Program is implemented by the Population Council in collaboration with the International Center for Research on Women, the International HIV/AIDS Alliance, the Program for Appropriate Technology in Health, Tulane University, Family Health International, and Johns Hopkins University.
Emergency Contraception’s Mode of Action Clarified

Emergency contraceptive pills, a hormonal treatment that can prevent pregnancy if taken within 72 hours of unprotected intercourse, have been the subject of heated debate. At issue is the method’s mechanism of action: does it prevent the meeting of egg and sperm, or does it prevent a fertilized egg from implanting in the uterus? Recent research by members of the Population Council’s International Committee for Contraception Research (ICCR) and other scientists shows that the most popular method of emergency contraception appears to work by interfering with ovulation, thus preventing fertilization, and not by disrupting events that occur after fertilization.

The most common and effective form of emergency contraception contains levonorgestrel, a progestin. It is sold in the United States and Canada under the name Plan B®. Reproductive physiologist Horacio B. Croxatto of the Chilean Institute for Reproductive Medicine in Santiago, Chile, and his colleagues studied the effects of levonorgestrel on the reproductive cycle of female rats, monkeys, and humans. Croxatto and one of his study partners, biomedical researcher Vivian Brache of PROFAMILIA in Santo Domingo, Dominican Republic, are members of the ICCR.

**Emergency contraception in women**

Croxatto and his colleagues studied the effects of levonorgestrel given to Cebus monkeys either before ovulation or postcoitally. The reproductive cycle of each animal was monitored by ultrasound examination of the ovaries, vaginal smear, and measurements of blood hormone levels, in order to time the administration of levonorgestrel. The researchers found that, when given before ovulation, levonorgestrel was able to inhibit or postpone ovulation. Alternatively, when it was given after mating—at a time when fertilization was believed to have occurred (on the basis of previous monitoring)—the pregnancy rates observed were identical in cycles treated with levonorgestrel or with a placebo. This indicates that levonorgestrel did not interfere with any postfertilization process required for embryo implantation.

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**Emergency contraception in animal studies**

Croxatto and his colleagues exposed female rats to very high doses of levonorgestrel at various stages in their reproductive cycle, either before or after ovulation or before or after mating. “When a woman uses emergency contraception,” Croxatto explained, “she does not know whether she is taking the pills before or after ovulation or before or after fertilization.” The researchers found that levonorgestrel inhibited ovulation totally or partially, depending on the timing of treatment and the dose administered. However, the drug had no effect on fertilization or implantation when it was administered shortly before or after mating or before implantation.

In 82 percent of Plan B-treated cycles, follicles failed to rupture within the five-day period following treatment (the maximum time span sperm would survive in the female reproductive tract), or there was some significant ovulatory dysfunction. These conditions occurred in only 41 percent of placebo cycles. The rate of ovulatory dysfunction observed with Plan B treatment is identical with the estimated efficacy rate of Plan B emergency contraception. Blood tests indicated that Plan B affects ovulation by suppressing the surge of luteinizing hormone (LH) that normally acts as a trigger for the ovulatory process.

“There is no doubt that fertilization would not have taken place in those women should they have had intercourse prior to treatment,” says Croxatto. “We conclude that the effects exerted by Plan B, when it is taken before the onset of the LH surge, may fully explain the pregnancies averted by emergency contraception. Failure to affect the LH surge, because treatment was begun too late in the fertile preovulatory period, explains the 20 percent failure rate of this method.”

**SOURCES**


Sperm with Bent Tails Point to Possible Male Contraceptive

New research on mice by scientists at the Population Council and Rockefeller University sheds light on male infertility. The findings, reported in the March issue of *Developmental Cell*, may also lay the groundwork for a reversible male contraceptive.

The Rockefeller University laboratory of Hermann Steller created mice that lack the gene *septin 4*. This gene is thought to be involved in apoptosis, the normal process that eliminates cells that are damaged, unwanted, or no longer needed. The mice were designed by postdoctoral fellow Holger Kissel to help with cancer research because apoptosis goes awry in cancer cells. Unexpectedly, Kissel discovered that the male mice were infertile even though they produced normal numbers of sperm. Kissel enlisted the help of Population Council cell and molecular biologist Gary Hunnicutt, an expert on sperm, to determine the cause of their infertility. Hunnicutt placed the sperm under the microscope and immediately noticed they are unable to swim and have tails that bend back upon themselves. The sperm have an appearance very similar to those seen in some infertile men.

During normal development, sperm cannot swim when they are extruded from the testis. It is not until they pass through the epididymis, a coiled, tube-like organ that lies between the testis and the vas deferens, that sperm mature and become motile. In the case of sperm from these mice, Hunnicutt noticed that their tails became bent as they passed through the epididymis. The tails on all the sperm bent at exactly the same position, at a site corresponding to a ring-like structure known as the annulus, whose function is unknown.

The missing annulus

Microscopic examination revealed that these sperm are missing the annulus, suggesting that this structure may be made of septin 4 protein, the production of which is controlled by the *septin 4* gene. Hunnicutt tested this hypothesis by using antibodies to the septin 4 protein to determine whether and where the protein was located on normal sperm. The analysis showed that the annulus is composed, at least in part, of septin 4 and when this protein is removed, as is the case in Kissel’s infertile mice, the annulus does not form.

It is at the annulus that the powerful whip-like beat of a sperm’s tail begins. This movement propels the sperm forward. The annulus may supply structural support to the tail at this site. Without an annulus, the sperm’s tail may “break” when it begins beating. Corroboration for this idea comes from the fact that the bending of the sperm tail within the epididymis happens at essentially the same time as the onset of motility. Hunnicutt and colleagues in his laboratory are investigating this possibility.

Septin proteins were first discovered in yeast about 30 years ago. They often form ringed structures that separate cellular components into different regions. The sperm annulus appears to compartmentalize sperm tail components. Although this has been hypothesized as a function of the annulus, it has never been testable until now.

Rearranging proteins and lipids

“Sperm, unlike other cells in the body, must respond to a host of different environments in both the male and female reproductive tracts,” says Hunnicutt. “Yet they do this without making any new proteins, which is the mechanism most cells use to function under different conditions.” 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 act like a turnstile, selectively allowing certain proteins or lipids on one side to move across the annulus and thus reach a new region of the sperm tail. Once these proteins and lipids have moved into this new sperm domain, they can react with the molecules already present in this area. This can trigger new chemical reactions that cause sperm to modify their function. “Studying sperm from mice lacking septin 4, which no longer have an annulus, will allow us to finally ask if the annulus truly acts as a turnstile,” says Hunnicutt. “Our findings will advance our understanding of how sperm become cells capable of fertilization.”

Interfering with the operation of the annulus may stop sperm from functioning properly. Discovering how to do this may lay the foundation 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

National Institutes of Health
Postabortion Complications Prevalent in Pakistan

Determining the levels of induced abortion and postabortion complications in various regions is essential because of the consequences these experiences have for women’s health. The Population Council has studied abortion and postabortion complications around the world, most recently in Pakistan. This comprehensive research has revealed a high level of unwanted pregnancy, induced abortion, and postabortion complications in that country. Abortion is legal in Pakistan to provide “necessary treatment.” This term is vague, however, and safe abortion services are not easily accessible.

Recent national demographic surveys indicate a high level of unmet need for family planning in Pakistan. This situation arises when women wish to avoid pregnancy but do not use a contraceptive method. Unmet need for family planning results in unwanted pregnancy. To investigate further, Population Council researchers conducted four studies in 2002 and 2003: a survey of health professionals, a survey of health facilities, a survey of women who suffered postabortion complications, and in-depth interviews with women (and their husbands) who had experienced an induced abortion. Data were collected in urban and rural communities in four provinces.

Incidence of induced abortion

Although the total fertility rate in Pakistan is 4.8, the wanted total fertility rate is 3.9, according to the 2000–2001 Pakistan Reproductive Health and Family Planning Survey. Hence, women in Pakistan average one unwanted birth in their lifetimes. The Council’s research suggests that 890,000 induced abortions were performed during 2002 and that the annual abortion rate is about 29 per 1,000 women aged 15–49. These figures indicate that the average Pakistani woman would experience one abortion in her lifetime. Nationally, about one in seven pregnancies is terminated by abortion. “What is strikingly clear from these estimates is that induced abortion is a widely used method of preventing unwanted births in Pakistan,” says Zeba Sathar, Population Council country director in Pakistan. Moreover, based on interviews with knowledgeable health professionals, the Council study estimates that 23 percent of all Pakistani women who obtain an abortion are hospitalized for treatment of complications they experience.

Council research reveals that abortions are performed by doctors, nurses, midwives, dai (traditional health practitioners), and others. The five abortion procedures most often named, though not necessarily performed, by health care professionals were dilation and curettage (D&C), intrauterine sticks (knitting needles, bamboo sticks), insertion of an intrauterine device (IUD), oral hormonal pills, and vaginal drugs. Women also sometimes attempt to produce their own abortions using a variety of techniques including drugs, herbs (taken orally or vaginally), insertion of objects, strenuous exercise, or vigorous abdominal massage.

Postabortion complications

The fraction of induced abortions leading to serious complications, according to the perceptions of Pakistani health professionals and women who had undergone an abortion, ranges from about 10 percent of abortions performed by obstetrician/gynecologists to 66 percent of those performed by dai or traditional birth attendants. The health facilities survey reveals that each year roughly 250,000 women are treated for postabortion complications—which can stem from either induced or spontaneous abortions, also known as miscarriages—in mid-size and large public-sector facilities and in private teaching hospitals alone.

The Council survey of health professionals reveals that most women in Pakistan who have induced abortions are nearing the end of their childbearing years. The women are aged 30 or older and have typically had three or more children. A majority of them know about contraception and have used a method in the past. The most common reasons women give for not wanting another pregnancy are that they have already achieved their desired family size, they cannot afford more children, they currently have very young children, and their health is poor. The Council’s research revealed that a variety of constraints, from financial costs to a fear of health side effects, prevent Pakistani couples from practicing effective contraception.

Policy suggestions

Council researchers met with Pakistani government officials, physicians, and professionals at nongovernmental organizations to share their findings and propose policy changes. Among their suggestions, family planning services need to tackle the various obstacles that prevent Pakistani couples from practicing effective contraception. Services need to be more accessible and less costly. Women’s and men’s fears about health side effects of contraception need to be squarely confronted. Medical care for postabortion complications should be more widely available and of higher quality. Men should be more effectively involved in resolving the various problems surrounding unwanted pregnancy—ineffective contraception, induced abortion, and its repercussions.

“No other piece of research that I have been involved with has had such a strong positive response, from government, civil society organizations, and the medical community,” says Sathar. “Policymakers and program managers seem ready to take action to avoid the morbidities and possible death associated with the large number of unwanted pregnancies and abortions.”

SOURCE

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TECHNICAL SUPPORT
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many schools are of poor quality, thus limiting enrollment, encouraging dropout, and compromising learning. “Results from recent internationally comparable standardized tests raise serious concerns about how much students are actually learning,” says Lloyd.

Nevertheless, the economic payoff for attending high school and college is consistently high, and the gap in income, job stability, and upward mobility between those who have attended only primary school and those who have completed more schooling is widening. In many parts of Asia, Latin America, and the Caribbean, increasing numbers of young people have been absorbed into the labor force without any large rise in youth unemployment; yet the challenge of providing employment for young people remains substantial in some of the poorer countries of Asia, sub-Saharan Africa, and the Middle East, given unprecedented growth in younger populations.

Rising school enrollment, trends toward greater democratization, greater access to the media, and globalization have all increased opportunities for young people to become active and involved members of their communities. Although television, radio, and newspapers are becoming more accessible to young people, their availability varies greatly by region. Among 15–19-year-olds, for example, 22 percent in southern and eastern Africa watch television at least once a week, compared with 91 percent in former Soviet Asia. The media, along with schools, employers, national service programs, and sports and other informal youth programs, play increasingly important roles in citizenship formation.

**Early marriage**

Marriage prior to age 18 is considered by many to be a human rights violation. According to Demographic and Health Survey data, which cover 60 percent of the developing world’s population, nearly 40 percent of young women marry before that age—down from about 50 percent two decades ago. Although the fraction of girls who marry at a young age is still substantial, Mensch observes that “the decline in early marriage is quite widespread, lending support to the notion that global changes are affecting the transition to adulthood.” However, even marked improvement in some areas is insufficient to fully overcome certain inequities. Young women in the developing world who marry as minors are more likely to come from poor households and rural areas and to have relatively little schooling.

Entry into marriage is strongly associated with entry into parenthood. More than 90 percent of first births occur within marriage, and this percentage has changed only minimally over the past 20 years. Early childbearing remains common in many parts of the developing world because of high rates of early marriage. According to Demographic and Health Survey data, 23 percent of young women aged 20–24 in the developing world gave birth before age 18. By comparison, in the United States in 1995, only 9 percent of young women aged 20–24 gave birth before age 18.

Poverty is the greatest barrier to making a successful transition to adulthood. As a percentage of the population, poverty rates have declined worldwide, except in sub-Saharan Africa. But as a result of rapid population growth, the number of young people living in poor families is roughly the same as it was ten years ago—325 million. There are more young people surviving on one dollar a day than there are people living in the United States, where the current population is roughly 300 million.

**Policy recommendations**

Substantial investments in the health and schooling of young people will equip them to participate constructively in shaping their own and their countries’ future. Policies and programs, if they are to be effective, must be evidence-based, locally appropriate, and designed in cooperation with developing-country governments and local communities.

Policies and programs designed to enhance successful transitions for young people should be targeted to the poor, particularly poor young women, who are often doubly disadvantaged. The panel also calls for interventions that promote gender equity in the arenas of citizenship, work, marriage, and parenthood in all social classes. “Achieving the United Nations Millennium Development Goals of universal primary schooling and gender equity in schooling will not be enough to ensure that the next generation of young people acquires the skills necessary for successful adulthood,” says Lloyd. “Policymakers should give equal attention to school quality and expanding enrollments at the secondary level.”

The panel recommends that policymakers increase the provision of general health information and sex education, including negotiating skills, for all young people and increase the availability of reproductive health services. Some of the most important reproductive health interventions for young people may lie outside the health sector. For example, school participation and higher levels of educational attainment appear to have positive associations with young people’s health; both male and female students who remain enrolled during their teens are substantially less likely to have had sex than their unmarried peers who are not enrolled. Indeed, the growing percentage of adolescents attending school may have contributed to delays in the age of sexual initiation in some countries, which were documented by the panel. Thus, resources spent on expanding opportunities for secondary schooling may have a direct effect on the reproductive health of young people.

The challenges of promoting a successful passage to adulthood for young people in developing countries are significant. Investing in their health and schooling as well as in opportunities for productive livelihoods will greatly enhance young people’s future prospects.

**SOURCE**

Biomedicine


Gender and Family Dynamics


HIV/AIDS


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Strengthening Local Resources


Transitions to Adulthood


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