Population Briefs, Vol. 10, no. 1

Population Council

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Schooling Trends in Africa: New Assessment Methods Needed

At least 37 million young people aged 10–14 in sub-Saharan Africa will not complete primary school, according to a recent analysis conducted by Population Council researchers. That number is nearly twice the total population of children aged 10–14 in the United States, virtually all of whom complete primary school. Moreover, nearly 21 million children in this age range in sub-Saharan Africa have never attended school.

In April 2000, at the World Education Forum in Dakar, Senegal, sub-Saharan African governments, along with others from around the world, recommitted themselves to achieving “Education for All” by 2015. Reaching this milestone by 2000 had previously been stated by the United Nations as one of its Millennium Development Goals.

The Population Council assessment, conducted by demographers Cynthia B. Lloyd and Paul C. Hewett, suggests that meeting this target will be difficult. Much needed are an international commitment to a greater level of resources, better tools for monitoring educational progress at the country level, and a focus on reaching the poorest families.

Consistent and comparable data

Currently, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) monitors advancement toward universal primary schooling using enrollment data gathered by government ministries of education. This information is used to determine the net primary enrollment ratio and the grade four completion rate.

The Population Council analysis, however, suggests that these data draw an incomplete and potentially biased portrait of levels, trends, and gender differences in school participation and grade attainment.

The UNESCO net primary enrollment ratio is based on first-day enrollments as reported by schools to their national ministries of education. These numbers are divided by United Nations estimates of the population for the year and ages in question. In many countries, financial support to schools is directly related to levels of enrollment. Therefore, local education offices have substantial motivation to inflate these numbers. Furthermore, children who formally enroll may not attend school regularly and therefore, while officially counted as participating in school, do not actually attend.

Lloyd and Hewett recommend consulting an alternative data source, the Demographic and Health Surveys (DHS), from which net attendance rates can be derived. These rates are likely to provide a more realistic picture of participation in primary school in sub-Saharan Africa. Information in the DHS is collected through interviews with individuals in their homes and is highly representative of the total population of sub-Saharan Africa. The questionnaires provide comparable data on the educational participation and attainment of household members in many developing countries.

continued on page 8
Carraguard® May Block HIV by Adhering to Cells

HIV may be ferried deep into the body from the vagina by immune system cells known as macrophages, suggests new research conducted by Population Council virologist David M. Phillips and his colleagues. The research also showed that the Council’s lead candidate microbicide gel, Carraguard®, is effective at reducing this form of HIV transmission in lab animals. The Population Council is preparing to enter into large-scale efficacy trials to test Carraguard’s efficacy in blocking HIV transmission in 4,000 nonpregnant women. The microbicide will be one of the first products of its kind to enter this advanced phase of research.

The active ingredient in Carraguard is carrageenan, a substance derived from seaweed. Carragenan compounds are on the U.S. Food and Drug Administration’s list of GRAS (generally recognized as safe) products for consumption and topical application.

The term “microbicide” refers to a range of products, in cream, gel, film, or suppository form, that would substantially reduce the transmission of HIV—and possibly other sexually transmitted infections (STIs)—when applied topically. If proven viable, these products would offer a powerful new prevention tool in the fight against AIDS. Globally, women’s rates of HIV infection are growing more rapidly than men’s, and the current strategies for prevention—mutual monogamy among HIV-negative partners, condom use, and treatment of existing STIs—are not practical for many women. Because of this urgent need for a woman-controlled product, and one that does not necessarily prevent pregnancy, the Population Council has focused to date on a vaginal, noncontraceptive microbicide.

**Macrophage trafficking**

Previous research by Phillips and others has suggested that macrophages, which ingest invading microbes, can migrate from the intact surface of the inside of the vagina to lymph nodes and other immune system structures inside the body. Some investigators have suggested that HIV-infected macrophages in semen can act as Trojan horses, transporting HIV into the body as they conduct their normal immune system duties.

To confirm whether macrophages could indeed make this journey, Phillips and his colleagues stained live mouse macrophages with an orange dye. They then inserted these cells into the vaginas of mice. Four hours later, the immune system organs were removed from the mice and processed. The investigators discovered an average of 55 orange-dyed macrophages per animal in lymph nodes from the pelvic and groin region. They also found an average of 558 orange-dyed macrophages per animal in the spleen, an immune system organ located just below the diaphragm.

The next step was to test the effectiveness of Carraguard against that of a placebo. The researchers used methylcellulose, a gel similar in appearance and consistency to Carraguard. This time, Phillips and his team treated mice vaginally with either Carraguard or methylcellulose 20 minutes in advance of introducing the macrophages.

In mice that received a vaginal pretreatment with Carraguard, an average of only four orange-dyed macrophages were found in lymph nodes per animal. An average of 26 macrophages reached the lymph nodes and 153 homed in on the spleen. When the mice were pretreated with methylcellulose, an average of 558 orange-dyed macrophages per animal in the spleen. The difference in these measures was highly significant, whereas the difference between methylcellulose-treated and untreated animals was highly significant, whereas the difference between methylcellulose-treated and untreated mice was not significant.

**Mechanism of action**

Eager to learn how Carraguard kept macrophages out of the body, Phillips and his team placed the cells in culture dishes containing either Carraguard or methylcellulose. They also left some macrophages unexposed to either substance. They wanted to see whether either substance could kill macrophages outright. They found that, although the viability of the macrophages exposed to Carraguard and methylcellulose was reduced somewhat compared to the unexposed macrophages, the exposed cells fared similarly. Some other mechanism must account for the inhibition of HIV transmission seen with Carraguard.

The researchers then sought to determine whether Carraguard prevented macrophage movement by binding to them. They used a technique that detects only carrageenan firmly attached to cells. They found that Carraguard adhered to both macrophages and the cells in the vagina. Because carrageenan is a large molecule that cannot enter the body through the vagina, “this binding is likely the mechanism that reduced the number of macrophages that traveled from the vagina to the lymph nodes and spleen,” says Phillips.

HIV may have several means of entering the body, the scientists note. Thus, it is important to develop microbicides that block HIV transmission in many ways. The Population Council continues to investigate ways of broadening the mechanisms that its candidate microbicides use to reduce HIV transmission.

**SOURCE**


**OUTSIDE FUNDING**

MIUR/University of Milan, the National Institute of Allergy and Infectious Diseases, the National Institute of Child Health and Human Development, and the Rockefeller Foundation

Since the printing of this newsletter, the Population Council has expanded the trial to four clinics and plans to enroll a total of 6,270 women.
Potential Data Biases in Studies Exposed

Female genital cutting (FGC), also known as female circumcision and female genital mutilation, has been the topic of much research and attention in the past ten years. Investigators seek to learn the prevalence of the procedure in a certain area, to ascertain the determinants of the practice, and to verify the effects of interventions aimed at reducing the incidence of the custom. Findings from a recent study conducted by the Population Council, however, suggest that results of such investigations should be interpreted with caution. Women interviewed about FGC may falsely deny or falsely confirm having undergone the procedure.

Navrongo Health Research Centre

The study is part of an experimental investigation in health services delivery launched by the Navrongo Health Research Centre in the Kassena-Nankana District of northeastern Ghana. The Centre’s core scientific resource is the Navrongo Demographic Surveillance System. Using this system, developed in part by Population Council demographer James F. Phillips, investigators have recorded demographic events among all residents of the area since 1993.

Yearly surveys collect more detailed information from a subset of women aged 15–49. In 1995 and 2000, for example, among the questions the survey asked women was, “Are you circumcised?” Almost 2,400 of the 5,275 women surveyed in 1995 answered the question again in 2000. Because of high rates of migration, fewer than half the women interviewed in 1995 were reinterviewed in 2000.

The responses from women who participated in both surveys were analyzed and the respondents were placed into four categories. In the first two categories were women whose survey answers in the two years agreed. In both surveys they reported either that they had or had not undergone circumcision. In the other two categories were women whose two survey answers disagreed. Some of these women said in the first survey that they had not been circumcised, but in the second survey said they had been. The researchers assumed that the women underwent circumcision in the time period between the two surveys. The rest of the women reported in the first survey that they had been circumcised, but subsequently said they had not been—an impossible sequence of events.

A relatively high rate of response reversal was not completely unexpected. In the past, nearly all women in the Kassena-Nankana area were circumcised, and women who avoided the procedure were stigmatized. In 1994, however, the government of Ghana passed a law banning female genital cutting, and in 1996 a circumciser in the Kassena-Nankana area was jailed. In the past several years there has been a notable decrease in the stigma attached to women who are not circumcised.

Women interviewed about FGC may falsely deny or falsely confirm having undergone the procedure.

There may be more than one explanation for response reversal. Women may be falsely denying circumcision. Or they may have incorrectly reported circumcision in the first survey because they felt pressured to give what they thought was a socially appropriate response. Because being uncircumcised had become less stigmatized by 2000, these women may have felt more comfortable reporting their true status.

The gold standard for settling this issue would be to conduct physical examinations of survey respondents. This method has drawbacks, however. Medical examinations require specially trained personnel and thus are costly. Moreover, many women may not agree to being examined, producing a biased sample.

Data analysis

The researchers analyzed the survey data to compare the marital status, education, and other characteristics of women who fell into each category. They found that women who in both surveys reported being uncircumcised had the highest education rates of the women surveyed. They were also more likely than other women to have used family planning and less likely to practice a traditional religion or be in a polygamous marriage. Women who reported being circumcised in the first survey but later denied it appear to occupy a middle ground. They are more likely to be educated and less likely to practice traditional religion than are women who reported circumcision in both surveys. And they are less likely to be educated and more likely to practice traditional religion than are women who never reported being circumcised.

Besides biasing data about the incidence of circumcision, the false reporting of circumcision status can influence conclusions drawn about the determinants of the practice. “If we had access only to the survey answers from 2000, we would have underestimated the influence of education, traditional religion, and marital status on circumcision,” says lead researcher Elizabeth F. Jackson, a Population Council staff associate at the time of the study. The researchers conclude that investigators should use caution when interpreting data on female genital cutting that are collected at a single point in time. In such studies, determining the rate of false reporting of circumcision status is more difficult than in other studies.

SOURCE


OUTSIDE FUNDING

United States Agency for International Development
Enhancing HIV/AIDS Care in South India

As of 2002, nearly 4 million adults in India were infected with HIV, according to UNAIDS. The number of new HIV infections in India is rapidly increasing, and the health care system is experiencing a substantial growth in the demand for services. To address this challenge, the Population Council’s Horizons program began collaborating with the International HIV/AIDS Alliance in September 1999 to examine the experiences of the Y.R. Gaitonde Centre for AIDS Research and Education (YRG CARE), a nongovernmental organization based in Chennai, India. YRG CARE provides a range of successful prevention, care, and support services for people with HIV/AIDS. The organization wanted to expand services in Chennai as well as introduce its style of services to organizations in four other locations in India: Calicut, Chirala, Mysore, and Pondicherry. Horizons employed operations research to facilitate this expansion of services.

In the HIV/AIDS field, operations research applies systematic research techniques to analyze factors that are under the control of program managers, such as improving the quality of services and counseling. An important objective of operations research is to provide managers with the information they need to improve and expand services.

This Horizons study includes components focusing on clients’ quality of life and satisfaction with services, in addition to institutional costs, clients’ willingness to pay for services, and the effect of treatment costs on clients’ budgets. The researchers investigated these issues using client surveys and in-depth interviews, personnel training and assessment, and the development of case studies for each location.

The USAID-funded Horizons research 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, Johns Hopkins University, and Family Health International.

Scaling up

Because of its reputation as a source of high-quality, affordable, and confidential care, YRG CARE has attracted clients not only from the Chennai area but from throughout South India, some of whom travel hundreds of miles for services. From its facilities in Chennai, the organization provides voluntary HIV counseling and testing, nutrition counseling, inpatient and outpatient care, and many other services. One of the main goals of the study was to find ways to transfer the clinic’s services and core concept—providing economical, high-quality HIV/AIDS care—to the new locations without necessarily imposing the Chennai managerial structure.

“It’s important to acknowledge that concepts and values rather than rigid organizational structures and models are the critical elements to export to a new environment,” says Chris Castle of Horizons/International HIV/AIDS Alliance.

For example, most of the services available at YRG CARE are provided in-house, with a few services being outsourced. In contrast, some of the scale-up sites, particularly the one in Calicut, found it best to outsource many of their services to trusted collaborators. As partnerships and networking intensified, referrals grew and care options increased.

In Chirala, researchers and collaborators discovered a need to emphasize counseling over other services. A manager there noted, “In Chirala, many testing centers are present, but many do not give counseling. So we want to take counseling as the first priority.”

Willingness-to-pay surveys

Meeting clients’ needs and maintaining quality of care while remaining solvent is one of the toughest issues facing any nonprofit service provider. In order to do this, many organizations must impose or increase service fees. The challenge is to increase fees to an amount that clients are willing and able to pay while ensuring that the poorest clients can continue to access those services. One way of investigating these issues is to conduct a willingness-to-pay survey. Using this method, the researchers found that clients value YRG CARE’s services and show considerable willingness to pay higher fees for services. Client responses indicated that although some could spend less on amenities to meet higher costs, most would seek money from friends or family members.

Another way of increasing sustainability is to more efficiently manage donated money and funds from existing sources. The research suggested that YRG CARE could expand its client base without reducing the quality of its services. Doing this would offset such fixed costs as rent and salaries. The organization could also use revenues gathered from more lucrative services to pay for deficits incurred by other services.

“It is unreasonable to expect that nongovernmental organizations, which serve some of the most disenfranchised members of society, can rely solely on user fees to offset the cost of providing care and support,” explains Rick Homan of Family Health International, a Horizons partner.

Future research efforts on the YRG CARE scale-up are likely to explore strategies for further improving the quality of service provision and for expanding access to antiretroviral therapy.

Sources

Outside Funding
United States Agency for International Development
How Long Will We Live? Demographers Refine Estimates

Estimates of current life expectancy at birth are routinely provided by national and international statistical agencies. These figures are important to policymakers because they measure progress in lowering a country’s overall level of mortality. Expected future trends are crucial to government officials, who project public health care and pension expenditures. The United Nations Population Division publishes estimates of life expectancy for all countries in the world, ranging from a low of 37 years in Sierra Leone to a high of 80 years in Japan for the period 1995–2000. In the United States, estimates are 74 years for men and 79 years for women in 1997.

These numbers, based on one of the oldest and most fundamental tools of demography, may be overestimated by up to a few years in contemporary countries with high life expectancy, say two demographers who have analyzed past and projected trends in mortality. In a paper published in the Proceedings of the National Academy of Sciences, John Bongaarts and Griffith Feeney question the accuracy of the underlying calculations that generate life expectancy figures. Bongaarts, vice president and director of the Population Council’s Policy Research Division, and Feeney, an independent consultant, identify a distortion in the calculations and provide a formula to amend the figures.

The distortion, which Bongaarts and Feeney term the “tempo effect,” has long been recognized by demographers studying fertility; the authors are the first to apply the calculations to mortality. In the case of fertility, tempo refers to the timing of childbirth: when women delay childbearing to later in life, fewer births occur in a particular year. Conversely, when women have children at a younger age, the number of births in a particular year will be inflated. The postwar “baby boom” in the United States, for example, was due in part to a decline in the average age at childbirth during the late 1940s and 1950s. Similarly, the low fertility observed throughout much of the 1970s and 1980s in the United States, western Europe, and Japan was in part due to an increasing age at childbearing, rather than an actual decrease in births per woman, the authors say.

According to Bongaarts and Feeney, the tempo effect influences mortality rates in much the same way. The medical advances currently experienced by developed countries raise the average age of death, whereas a deadly epidemic like AIDS can lower the age.

“We don’t live quite as long as we thought we did.”

We don’t live quite as long

The tempo effect is most readily demonstrated in contemporary societies with high life expectancy, such as Japan, the United States, and many European countries. Based on the demographers’ calculations, removal of the tempo effect reduces estimates of life expectancy for women by 1.6 years in the United States and Japan was in part due to an increasing age at childbearing, rather than an actual decrease in births per woman, the authors say.

According to Bongaarts and Feeney, the tempo effect reduces estimates of life expectancy, such as Japan, the United States, and many European countries. Based on the demographers’ calculations, removal of the tempo effect reduces estimates of life expectancy for women by 1.6 years in the United States and Sweden, by 2.4 years in France, and by 3.3 years in Japan for the period 1980–95.

While a reduction of two or three years may not seem like a big difference on the individual level, the societal implications are considerable. “We don’t live quite as long as we thought we did,” Bongaarts says. “And in the long run, two or three years can have a substantial impact on the total future expenditures on pensions and health care for the elderly.”

Furthermore, the differences between countries are quite substantial and somewhat surprising, Bongaarts notes. In Japan, life expectancy for women is currently 83 years, while in western Europe the average is 81 for 1995–2000. Current population projections assume that the rest of the world will eventually converge to Japan’s level. “We demonstrated that Japan’s number has the largest distortion. If you eliminate the distortions, Japan ends up looking very much like France or Sweden,” Bongaarts says. The distortion in Japan is larger than in the other countries because the tempo effect depends on the rate at which life expectancy is rising—the more rapid the rise, the greater the distortion. During the last 25 years, life expectancy in Japan has been rapidly rising, outpacing relatively modest gains experienced by the United States and western European countries.

Are there limits to life spans?

The heart of the issue is not necessarily how long we live now, but how high life expectancy will rise and whether there is a limit on those advances, Bongaarts says. Scholars are divided into two camps. The optimists—those who see gains in life expectancy of a few years each decade—predict life spans as great as 100 years by 2050. The pessimists—those who believe in biological limits—think we may be nearing the maximum longevity. “If the optimists are right and we continue to gain years in life expectancy, then the health care costs and pension costs are going to be higher than expected. If the pessimists are right, then the current projections are too high,” Bongaarts says. Although the new findings don’t resolve this controversy, the study lends more support to the pessimists’ point of view.

SOURCE

OUTSIDE FUNDING
The William and Flora Hewlett Foundation and the Andrew W. Mellon Foundation
Investigating IUD Demand in Ghana and Guatemala

As the longest-acting method of reversible contraception available, the intrauterine device (IUD) has long been considered one of the most effective—and cost-effective—of contraceptive options. Once placed in the uterus, the device requires little attention and remains functional for ten years. Medically, the IUD is well suited for women who are in a stable, mutually monogamous relationship and are not at risk for sexually transmitted infections (STIs) and pelvic inflammatory disease. Like other nonbarrier methods of birth control, the IUD does not protect against HIV/AIDS or other STIs, but it can be combined with condom use when a woman desiring long-term contraception is unsure of her partner’s HIV or STI status.

When researchers and policymakers in Ghana and Guatemala noticed a drop in IUD use over the past few years, they wondered why. Had the method gained a bad reputation, were clients poorly informed, was the quality of services poor? Although the research teams were working separately—using different survey questions and methods of analysis—their findings point to the same explanations: lack of knowledge among providers and clients, logistical problems, and cumbersome clinic guidelines. Myths and rumors also surrounded the method, with both providers and potential clients misinformed about the IUD’s side effects and contraindications.

The researchers concluded that efforts to increase use should include more comprehensive training of providers; better counseling to make sure that providers discuss not only IUDs, but all relevant methods; more comprehensive training of providers; and logistical support for clinics.

The studies in Ghana and Guatemala were sponsored by the Population Council’s Frontiers in Reproductive Health program, designed to improve the delivery of family planning and reproductive health services in developing countries. Researchers surveyed public, private, and nongovernmental health clinics in both rural and urban settings. They relied on focus groups, in-depth interviews, and visits to providers by women who posed clients to examine providers’ and clients’ knowledge and attitudes about IUDs.

According to study authors Carlos Brambila and Berta Taracena, IUD use in Guatemala is considered low relative to the estimated demand for long-term methods. The prevalence of contraceptive use among women in marriages and partnerships in Guatemala is 38 percent, of these only 2 percent use IUDs.

In Guatemala, close to 90 percent of clinics had the necessary facilities (a clean, private room) and at least one worker trained in IUD insertion and removal, but about half lacked the supplies and equipment (IUD insertion kits and gloves) to offer these services. The reverse was true in Ghana, where only 56 percent of the clinics had the facilities to offer IUDs, but 91 percent had the necessary supplies available. Furthermore, focus group members in Guatemala said that the need to travel to urban clinics made IUDs too expensive. In Ghana, only doctors and midwives—not nurses—are allowed to insert IUDs, a policy that further restricts access.

Policy implications

The researchers and policymakers make several recommendations. Educational efforts should focus on the IUD’s positive attributes as well as the contraindications of the product, and marketing efforts should focus on increasing the method’s visibility. Clinical guidelines should be revised to incorporate the training of paraprofessionals and nonmedical staff, and testimonials of satisfied clients could be used to dispel rumors and demystify the product.

Already changes are underway. In Ghana the study’s findings are being disseminated to providers nationwide; in Guatemala, nurse auxiliaries are being trained in IUD service provision, including counseling and clinical care. Furthermore, researchers in both countries are developing and testing strategies to increase people’s awareness of the IUD’s advantages.

Sources


Outside Funding

United States Agency for International Development
**Recent Publications**

**Biomedical Research**

**Product development**


**Reproductive physiology**


**Building Research Capability and Tools**

**Developing or adapting research tools**


**Gender and Family Dynamics**


**Girls’ and women’s livelihoods**


**Violence against women**


**HIV/AIDS**

**Basic science of infection**


**Prevention**


**Treatment, care, and support**


**Youth**


**Population and Social Science Research**

**Journal**

Population and Development Review 29(3)

**Aging**


**Fertility and reproductive behavior**

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Recent Publications

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Policy development


Quality of Care/Quality of Services

Expanding contraceptive choices


General quality of care improvement


Reproductive Health


Journal

Studies in Family Planning 34(3)

Adolescents


Contraception


Family planning and reproductive health programs


Female genital cutting


Large-scale experimental programs


Reducing unsafe abortion


Reproductive tract infections and sexually transmitted infections

The Population Council conducts biomedical, public health, and social science research on global issues, including reproductive health, HIV/AIDS, and population trends.
Education

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Findings

When Lloyd and Hewett compared the data from UNESCO and the DHS, they found that enrollment ratios derived from UNESCO tended to be higher than attendance rates derived from the DHS. This finding provides strong evidence that, in at least some countries, some portion of officially recorded enrollments does not represent regular school attendance. Additionally, UNESCO enrollment estimates imply much larger gender gaps in school participation than do DHS attendance estimates.

The investigators also compared DHS and UNESCO data on grade four completion. To derive this figure, UNESCO determines the ratio of the number of children enrolled in grade five relative to the number enrolled in grade one four years earlier. This measure does not account for grade repetition or temporary withdrawal, however. An alternative measure from the DHS that does not have these limitations is the percent of 15–19-year-olds who have completed four or more years and the percent who completed primary school.

For boys, the percent completing primary school is estimated to have risen in sub-Saharan Africa from roughly 46 percent in the late 1960s to about 57 percent in the late 1990s. Most of the improvement occurred in the 1960s and 1970s. Over the same period of time, girls’ primary school completion rate rose from a much lower base, around 26 percent, to 53 percent. As with boys, the pace of progress has largely slowed in the last 20 years. These trends, however, have closed the education gender gap considerably.

Grade four completion rates are slightly higher than primary completion rates for both boys and girls. This discrepancy indicates an attrition rate between the end of grade four and the end of primary school of roughly 10 percent points. There has also been a small recent decline in grade four completion rates for boys, a trend that may point to future erosion in boys’ schooling.

These long-term trends mirror economic and political developments in the region as a whole. In the 1960s and 1970s, strong economic growth allowed for impressive educational expenditures. In the 1980s, however, stagnating economies, political unrest, and rapid population growth conspired to curtail these investments. One result of these cuts has been the assessment of schooling fees in many countries. Thus, poorer families may be less able to send their children to school.

Unlike the UNESCO data, the DHS data allow investigation of the effect of wealth on schooling. This investigation shows that while the gender gap is narrowing, a large schooling gap exists between the poorest and wealthiest households.

“Our research highlights the numerous gaps that still need to be addressed to reach the Education for All goals. Creating new strategies to address these challenges will require adequate data. The data now being collected by UNESCO may not provide all the information necessary, particularly for developing programs to help the poorest parents and their children,” states Lloyd.

SOURCE