

 Adolescent Health 2

Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential

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Lancet 2007; 369: 1220–31

Published Online

March 27, 2007

DOI:10.1016/S0140-

6736(07)60367-5

This is the second in a **Series** of six articles about adolescent health

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Worldwide, societal shifts and behavioural patterns exacerbated by unique developmental vulnerabilities create a confluence of factors that place today's adolescents at heightened risks for poor health outcomes. Country-level data show that continued investment in effective prevention and treatment strategies is essential to protect adolescents' sexual and reproductive health. Whereas strategies must be tailored to the developmental needs of this age group and their social contexts, effective approaches are multifaceted. All adolescents need access to quality youth-friendly services provided by clinicians trained to work with this population. Sex education programmes should offer accurate, comprehensive information while building skills for negotiating sexual behaviours. Girls and boys also need equal access to youth development programmes that connect them with supportive adults and with educational and economic opportunities. Although progress has been made since the 1994 International Conference on Population and Development, adolescents continue to be disproportionately burdened by threats to their sexual and reproductive health.

Today's generation of adolescents is the largest in history. Nearly half of the global population is less than 25 years old¹ (the UN uses the term adolescents for people aged 10–19 years, young people for those aged 10–24 years, and youth for those aged 15–24 years^{2,3}). Negative outcomes of early pregnancy and sexually transmitted infections (STIs), including HIV/AIDS, threaten the health of people in the second decade of life more than any other age group. At the same time, adolescents are the greatest hope for turning the tide against STIs, AIDS, and early pregnancy. The few countries that have successfully decreased national HIV prevalence have achieved these gains mostly by encouraging safer sexual behaviours in adolescents.⁴

Questions about why and how to invest in turning the tide can only be answered with an understanding of the

uniqueness of this age group and the social contexts that increase adolescents' vulnerability to poor sexual health outcomes. Many factors contribute to their risk for STIs, HIV, or negative health outcomes of early pregnancy, with even greater vulnerability for some subgroups. Biologically, the immature reproductive and immune systems of adolescent girls translate to increased susceptibility to STIs and HIV transmission; pregnancy and delivery for those with incomplete body growth exposes them to problems that are less common in adult women.² Many societal issues also contribute to risks for adolescents.⁵ Age differences between heterosexual partners (younger girl and older male partner), gender differences in norms for sexual behaviour (eg, sexual involvement expected for boys and men while negatively sanctioned for girls and women), and early marriage for girls⁶ could all heighten the possibility of sexual coercion.^{7,9} Moreover, in much of the developing world, some young people experience pressure to become sex workers as the only available option for contributing to the food and shelter needs of their family.¹⁰ Those who become sex workers are at heightened risk of STIs, pregnancy, and violence, but may avoid health care for fear of being judged or stigmatised.

To regard people in the second decade of life as a unique group, especially in terms of health risks and health services, is a relatively new notion. Although developmentally distinct from children and adults in terms of physical maturity, cognitive capacity, and social skills, historically, health services for adolescents have not been differentiated. For unmarried adolescent boys and girls, services are offered as part of child health care and do not encompass sexual and reproductive health. If married, services for adolescent girls are part of reproductive care for adult women.¹¹ However, several

Search strategy and selection criteria

This article was based on a review of publications focused on the reproductive health of adolescents, including studies in peer-reviewed journals (eg, on evaluation of clinical or sex education programmes), reviews analysing sets of such studies, and monographs, mainly from globally-focused health and development organisations such as the Joint United Nations Programme on HIV/AIDS, WHO, Family Health International, the United Nations Population Fund, The Gutmacher Institute, the UN Millennium Project, and other country-level or regional non-governmental agency reports. Publications used in preparation of this manuscript were identified through three databases (PubMed, OVID, CINAHL) by use of relevant key words; searches of websites of lead international health organisations; nominations of publications by lead experts in adolescent reproductive health; and references cited in recent peer-reviewed publications and in non-peer-reviewed reports (to maximise inclusiveness—ie, monographs from international health and development organisations focused on country, regional, and global trends in STI, HIV, and pregnancy indicators and prevention efforts). Emphasis was given to material published since 2000, with all publications before 1995 excluded, except to present historical references.

historical changes have rendered this approach outdated. First, acknowledging wide cultural variation, adolescents are increasingly delaying marriage—for some, to pursue education or employment options.¹² Urbanisation has an important role in this societal shift.² Second, historically, societies expected childbearing to follow shortly after marriage; now norms are shifting towards delayed childbearing. These key changes, which affect all societies by varying degrees, have expanded the gap between puberty and marriage, and between marriage and childbearing. Thus, assumptions about the adequacy and effectiveness of health-service delivery through paediatric or adult reproductive services are no longer appropriate in developing or developed countries. Adolescents, for many reasons, have urgent need for accessible, quality health care.

Aspects of development that characterise adolescence, sexual behaviour, and risk can vary by gender, race, ethnicity, geography, and socioeconomic status, as well as in relation to the traditions, mores, and values defined by the community.⁵ Variation in biological maturation, age of sexual debut, type and number of sexual partners, and use of condoms and contraceptive methods, along with educational and marital options and norms, and the possibility of sexual coercion, create a confluence of factors that may protect against STIs, HIV, or early pregnancy, or increase a young person's risk of experiencing these problems.

In this article, we discuss the patterns and prevalence of adolescents' sexual behaviours and reproductive health outcomes, all of which show huge regional and country-level variation.⁹ Notably, available data are often not disaggregated for the adolescent age group, and thus particular vulnerabilities and issues are sometimes hidden.^{6,7} We present strategies that have been shown to reduce threats to the sexual and reproductive health of adolescents, and discuss key steps towards achieving goals relating to young people's reproductive rights.

Sexual behaviours and use of contraceptives

The timing of first sexual intercourse and the context in which it occurs both have health implications. In some parts of the world, for instance in North Africa and parts of Asia, most sexual activity reported even 10–15 years ago takes place within the context of marriage.¹³ With the gap between age at first sexual intercourse and age at marriage widening in many developing countries, more people are sexually active before marriage than in the past.¹⁴ A study from 2000 with data from 14 countries showed that the context of early sexual experience often differs between young men and young women, especially in developing regions.¹³ For boys, most sexual relationships during the teenage years are non-marital. In girls, a sizeable proportion—notably the largest proportion in some developing countries—occur within marriage.¹³

Table 1^{13,15–23} provides a summary of some sexual behaviours in unmarried teenagers worldwide. We compare data for entire countries and, in doing so, pay less attention to the substantial variability within countries. Our choice of indicators was guided by the need to describe aspects of sexual behaviour relevant to reproductive health, and by available country-level survey data.

The proportion of unmarried youth who are sexually experienced is of public-health interest. These young people, along with their married peers, are at risk of STIs and pregnancy during adolescence. In most countries of the developed world and sub-Saharan Africa (except Nigeria and Rwanda), a third or more of unmarried adolescent girls have had sexual intercourse. In the Philippines, eastern Europe, and Latin America, smaller proportions have had intercourse, ranging from less than 1% in Azerbaijan and the Republic of Georgia to 30% in the Ukraine (table 1). In most countries, more than 40% of unmarried adolescent boys have had intercourse, compared with less than a third in Nigeria, Rwanda, and the Philippines (table 1).

Young people who have several sexual partners are at increased risk of contracting STIs, including HIV.¹² In countries where data are available, a substantially larger proportion of adolescent boys than girls have had two or more partners in the past year (table 1). These differences might in part be due to cultural pressures on boys to prove their virility.^{6,12} The double standard for sexual behaviour, whereby restraint is expected of girls and excesses are tolerated for boys, compounds reproductive health problems for both sexes.⁹

Condom use is a key means of preventing negative reproductive health outcomes. Although data from sub-Saharan Africa and the developed world suggest that use of condoms by adolescents is increasing worldwide,^{12,24} the proportion of sexually active young people who report condom use is clearly too small to contain the spread of STIs.² In most sub-Saharan African countries, Azerbaijan, the Republic of Georgia, and the Philippines, less than a third of sexually experienced adolescent girls report using a condom at most recent sex; the proportion is half or more in Uganda, Romania, the Ukraine, Latin America, and the developed world. In most sub-Saharan African countries, Latin America, and the developed world, condom use at most recent sex is greater in adolescent boys than girls (table 1). In most countries for which two estimates are available, the prevalence of condom use is increasing in young people.⁹ Use of condoms at most recent sex among single young women in 19 African countries increased from 19% to 28% between 1993 and 2001. Condom use by young people in developed countries has also increased substantially.⁹

Use of medical contraceptive methods is another key to prevention of negative reproductive health outcomes. In a study²⁵ comparing use of such methods in nationwide samples of sexually experienced adolescent girls, teen-

agers in the USA reported less use of contraceptive pills, injectables, implants, and intrauterine devices at most recent sex (42%) than did girls from Canada (64%), France (50%), and the UK (69%). In the developing world, use of medical contraceptive methods is substantially lower among adolescent girls than in adult women.¹⁴ In sub-Saharan Africa, very small proportions of unmarried, sexually experienced girls aged 15–19 years used medical contraceptive methods at most recent sex (for example, 4% in Benin, 10.7% in Kenya, 12.4% in Mali, 8% in Uganda, and 5.2% in Zimbabwe).^{26–30} Current use of medical methods is slightly greater in unmarried, sexually experienced adolescent girls in Latin America and the Caribbean (for example, 41.3% in Brazil, 29.7% in Columbia, 16.1% in the Dominican Republic, and 34.3% in Nicaragua).^{31–34} Adolescent girls commonly face obstacles when seeking medical contraceptive methods, including insufficient knowledge about modern methods, limited access to services,^{12,35,36}

and even health-care providers who actively discourage use of such methods by teenagers.³⁷

Birth and abortion rates

National health statistics typically include rates of birth (as opposed to pregnancy rates) for 15–19-year-olds (table 2).^{6,38–41} In the developing world, birth registration rates differ widely; thus, data from some developing countries in table 2 represent a best estimate.

In sub-Saharan Africa, the average birth rate (for most recent year available) per 1000 girls aged 15–19 years is 143, varying from 37 in Mauritius to 229 in Guinea.^{6,39} This rate is high compared with the worldwide average of 65. In some sub-Saharan African countries, one in five adolescent girls gives birth each year, so almost all are likely to have had a child by age 20 years.⁶ From the mid-1970s to the early 1990s a trend towards lower adolescent fertility rates was noted in several countries, with the largest changes in Kenya and Senegal.⁴²

	Age range (years)	Proportion with sexual experience		≥2 partners during past 12 months (among sexually experienced individuals)		Condom use at last sex (among sexually experienced individuals)	
		Female	Male	Female	Male	Female	Male
Sub-Saharan Africa¹⁵							
Benin, 2001	15–19	42%	50%	3%	22%	19%	37%
Gabon, 2000	15–19	63%	77%	17%	29%	34%	47%
Kenya, 1998	15–19	33%	53%	6%	44%	16%	40%
Malawi, 2000	15–19	37%	59%	2%	16%	29%	29%
Mali, 2001	15–19	33%	34%	3%	17%	13%	21%
Nigeria, 1999	15–19	22%	25%	U	37%	22%	29%
Rwanda, 2000	15–19	7%	20%	2%	4%	27%	41%
Tanzania, 1999	15–19	37%	56%	9%	32%	21%	27%
Uganda, 2000	15–19	33%	34%	4%	15%	50%	49%
Zambia, 2001	15–19	44%	63%	5%	19%	28%	29%
Zimbabwe, 1999	15–19	14%	29%	3%	15%	37%	58%
Eastern Europe/central Asia¹⁶							
Azerbaijan, 2001	15–19	<1%	U	U	U	2%*†	U
Georgia, 1999	15–19	<1%	U	U	U	2%*†	U
Romania, 1999	15–19	22%	45%	U	U	47%*†	U
Ukraine, 1999	15–19	30%	U	U	U	57%*†	U
Asia							
Philippines, 2004 ¹⁷	15–24	16%	31%	U	U	27%†	22%†
Latin America							
Brazil, 1996 ¹³	15–19	22%	63%	U	58%*	U	34%*‡
El Salvador, 2002–03 ¹⁹	15–19	25%	50%	U	U	50%*†‡	62%*†‡
Guatemala, 2002 ¹⁹	15–19	9%	38%	U	U	U	36%*†‡
Honduras, 2001 ¹⁹	15–19	18%	48%	U	U	54%*†‡	72%*†‡
Developed countries							
Australia, 2001–02 ^{20,21} §	16–19	56%	59%	24%	32%	54%	80%
Canada, 1996 ²²	15–19	55%	47%	33%	41%	U	U
USA, 2002 ²³	15–19	46%	46%	30%	39%	54%	71%

U=unknown. *Reported in 15–24-year-olds. †Includes condoms or other modern contraceptive methods. ‡Reported method of current contraceptive use. §And Rissel C, University of Sydney, personal communication.

Table 1: Sexual activity and use of condoms in unmarried adolescents, by country

In north Africa and the Middle East, the average birth rate is around 56, varying from 7·5 in Tunisia to 122 in Oman.^{6,39} In several countries in this region, the rate of adolescent pregnancies fell substantially between the mid-1970s and the early 1990s.⁴² In central Asia, the average rate is around 59, ranging from 27·7 in Azerbaijan to 152 in Afghanistan.^{6,39} In east and south Asia and the Pacific, the average rate is 56, varying from 3·6 in China to 115 in Bangladesh.^{6,39} Since the mid 1970s, birth rates have fallen in some south Asian countries with traditionally the highest rates of adolescent marriage and birth.⁴² In Europe, the average rate is around 25, ranging from 5·4 in Switzerland to 40·4 in Bulgaria.^{6,39}

In Latin America, the average birth rate is about 78, ranging from 48·3 in Cuba to 149 in Nicaragua.^{6,39} In most countries of this region, rates do not seem to have decreased; in some countries, increases were noted from the mid-1970s to the early 1990s.⁴² In North America, birth rates vary greatly between Canada and the USA. In the USA, rates of adolescent pregnancy (75·4) and birth (41·1) are among the highest in the developed world, although these rates have fallen substantially since the early 1990s.^{41,43} Although the two regions are geographically near and culturally similar, rates of teenage pregnancy (32·1) and birth (14·4) in Canada are much lower than in the USA.⁴⁰

Adolescent birth rates are intertwined with rates of spontaneous and induced abortions. While the rate of spontaneous abortions probably does not vary substantially, even between various populations, rates of induced abortions differ greatly between countries, and between social and ethnic subgroups within countries.^{44,45} Economic, legal, moral, and religious contexts are likely to have different effects on subgroups regarding decisions about abortion.⁴⁴

In some countries, the registration of legally induced abortions is reliable; in others, numbers are based on rough estimates or speculation. Findings of a study in 34 countries showed that in most countries, rates of induced abortion had an inverted U pattern in relation to age of women—ie, were greatest in the younger and older age groups. In 27 countries, abortion rates were highest among women in their 20s.⁴⁴ The incidence of abortion among 15–19-year-olds is by no means negligible in many countries with reliable national statistics. In countries where abortion is legal under broad conditions, rates of abortion are relatively high (29–44 abortions per 1000 girls aged 15–19 years per year) in Bulgaria, the Russian Federation, and the USA, and moderately high (20–28) in Australia, Canada, and New Zealand. Germany, Italy, and Japan have the lowest rates of adolescent abortion (<10).

Throughout the world, estimates indicate that 46 million pregnancies are voluntarily terminated every year; 27 million legally and 19 million outside the legal system.⁴⁶ All but 3% of 19 million unsafe abortions per year happen in developing countries. In some countries

where access to safe abortion is restricted, unsafe abortion causes more than 30% of maternal deaths. Importantly, from a public-health perspective, 2·5 million (almost 14%) of all unsafe abortions in developing countries are in women younger than 20 years. Unsafe abortions vary substantially by age across regions: 15–19 year olds account for 25% of all unsafe abortions in Africa, whereas the proportion in Asia, Latin America, and the Caribbean is much lower. The age pattern of unsafe abortion is important in understanding barriers to health-care access.^{25,36,37}

	Birth rate
Sub-Saharan Africa	
Benin	133(1998) ³⁸
Gabon	175(1998) ³⁸
Guinea	229(1998) ⁶
Kenya	101(1998) ³⁸
Malawi	159(1998) ³⁸
Mali	181(1998) ³⁸
Mauritius	37(2003) ³⁹
Nigeria	138(1998) ³⁸
Rwanda	54(1998) ³⁸
Senegal	142(1998) ³⁸
Tanzania	124(1998) ³⁸
Uganda	179(1998) ³⁸
Zambia	132(1998) ³⁸
Zimbabwe	114(1998) ³⁸
North Africa and Middle East	
Egypt	19(1999) ³⁹
Jordan	44(1998) ⁶
Israel	16(2003) ³⁹
Morocco	29(2001) ³⁹
Oman	122(1998) ⁶
Saudi Arabia	114(1998) ⁶
Sudan	52(1998) ⁶
Tunesia	8(1998) ³⁹
Turkey	50(1997) ³⁹
Central Asia	
Azerbaijan	28(2003) ³⁹
Afghanistan	152(1998) ⁶
Georgia	31(2000) ³⁹
East/South Asia and Pacific	
Australia	20(2000) ⁶
Bangladesh	115(1998) ⁶
China	4(2003) ³⁹
India	107(1998–99) ⁶
Japan	6(2003) ³⁹
New Zealand	34(2000) ⁶
Pakistan	24(2001) ³⁹
Philippines	32(2000) ³⁹
Sri Lanka	20(1997) ⁶
Thailand	70(1998) ³⁸
Vietnam	33(1998) ³⁸
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Europe	
Bulgaria	40 (2003) ³⁹
Czech Republic	14 (2002) ³⁹
France	8 (2002) ³⁹
Germany	12 (2003) ³⁹
Great Britain	27 (2003) ³⁹
Italy	7 (2003) ³⁹
Poland	15 (2003) ³⁹
Romania	34 (2003) ³⁹
Russian Federation	29 (1999) ³⁹
Sweden	7 (2002) ³⁹
Switzerland	5 (2002) ³⁹
Ukraine	29 (2003) ³⁹
Latin America	
Argentina	59 (2003) ³⁹
Brazil	71 (1998) ³⁸
Bolivia	79 (1998) ³⁸
Chile	50 (2003) ³⁹
Cuba	48 (2003) ³⁹
El Salvador	79 (2003) ³⁹
Guatemala	110 (1999) ³⁹
Honduras	113 (1998) ³⁸
Mexico	77 (1998) ⁶
Nicaragua	149 (1997) ⁶
North America	
Canada	32 (2003) ⁴⁰
USA	41 (2004) ⁴¹

Table 2: Birth rates (per 1000 girls aged 15–19 years) in selected countries, for most recent year available

STIs including HIV/AIDS

WHO has estimated that 340 million new cases of curable STIs—syphilis, gonorrhoea, chlamydia, and trichomoniasis—occur every year. The largest number of new infections occurred in south and southeast Asia, followed by sub-Saharan Africa, Latin America, and the Caribbean. Data from epidemiological surveys show that within countries and between countries in the same region, the prevalence and incidence of STIs can vary widely, between urban and rural populations and even similar population groups, reflecting differences in social, cultural, religious, and economic factors.⁴⁹ Worldwide, the largest proportion of STIs is believed to occur in people younger than 25 years, with more than a fifth to greater than half of some STIs occurring in young people.^{2,50,51} Valid data on worldwide incidence and prevalence of STIs, especially in sexually active, unmarried young people in developing countries, are rare because STI surveillance has been largely neglected and underfunded.⁵² A recent study examined incidence from 1985 to 1996 of three common STIs—gonorrhoea, syphilis, and chlamydia—using national statistics for 15–19-year-olds from 16 developed countries. The incidence of these three diseases decreased between the

mid-1980s and the mid-1990s, in the general population and in adolescents. For all STIs studied, incidence was generally higher for adolescent girls than for boys, partly because girls were more likely to be screened. In the mid-1990s, the incidence of gonorrhoea in adolescents was fairly low—less than ten per 100 000 in nine countries, and ten to 20 in one country studied. Incidence of gonorrhoea was distinctly higher in the Russian Federation and the USA, where rates approached 600 per 100 000. Incidence of syphilis in adolescents was also low, with most countries reporting rates of less than three cases per 100 000. A notable exception was the Russian Federation (which had an epidemic of STIs beginning in the early 1990s), where the rate of syphilis was 313 per 100 000 adolescent girls. By contrast, incidence of chlamydia in 15–19-year-olds was extremely high, ranging from 563 cases per 100 000 in Canada to 1132 per 100 000 in the USA. Chlamydia incidence was four to six times higher in adolescent girls than in boys.⁵⁰ Since the 1990s, prevalence of STIs has continued to rise in most countries, including developed countries.^{51,52}

Worldwide, 6000 young people are estimated to be infected with HIV every day.⁵³ The figure⁴ provides a regional breakdown of the estimated 10 million 15–24-year-olds living with HIV; table 3⁴ shows regional estimates of HIV prevalence in 15–24-year-olds. Adolescents are exposed to HIV in different ways. In sub-Saharan Africa, which includes almost two-thirds of all youth living with HIV worldwide, the main mode of transmission is heterosexual intercourse. Tremendous diversity exists across the subcontinent in rates of HIV infection, with southern Africa being the worst affected region in the world. About 75% of all young people living with HIV in sub-Saharan Africa are female. Prevalence is higher in adolescent girls than in adolescent boys in all countries, with the ratio of girls to boys living with HIV ranging from 20 to ten in South Africa, to 45 to ten in Kenya and Mali.⁴ In central Asia and eastern Europe, prevalence of HIV in young people is rising rapidly because of injecting drug use, and, to a lesser extent, unsafe sex.⁴ In Latin America and the Caribbean, HIV is spread predominantly through sexual intercourse, both heterosexual and among men who have sex with men.⁴ In North America and western Europe, the main mode of HIV transmission is sexual activity.⁴

Strategies for prevention and health promotion

Despite the vastly differing patterns of sexual health behaviours and outcomes and the great diversity in the life situations that determine adolescents' reproductive health pathways, common elements comprise prevention and health promotion worldwide.^{54,55} As noted by Wellings and colleagues⁹ in the recent *Lancet* series on sexual and reproductive health, "...no general approach to sexual-health promotion will work

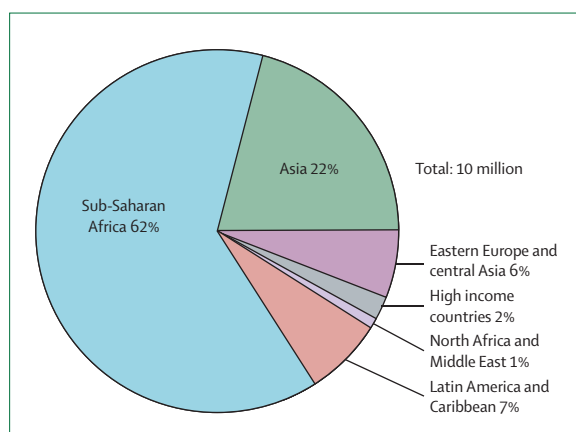


Figure: Young people aged 15-24 years living with HIV (Joint United Nations Programme on HIV/AIDS, 2004)⁴

everywhere, and no single-component intervention will work anywhere". We present three key strategies for prevention and health promotion with adolescents that together are essential for improving their sexual and reproductive health: clinical services that assure accessible and high-quality reproductive health care; sex education programmes that provide developmentally appropriate, evidence-based curricula; and youth development strategies to enhance life skills, connections to supportive adults, and educational and economic opportunities.

Clinical services

For more than a quarter of a century, health services have been internationally acknowledged as an vital element to improving adolescent sexual and reproductive health.^{56,57} Ideally, adolescent clinical services encompass prevention, diagnosis, and treatment of STIs and HIV, prevention of cervical cancer, and prevention and care during pregnancy and childbirth. Furthermore, they need to be available, accessible, acceptable, and appropriate for adolescents.⁵⁸ When they are not, the consequence is delayed or foregone care with immeasurable short-term and long-term costs.

Contraceptive and STI prevention services

The most basic needs of adolescents, regardless of culture, age, and marital status, are for accurate and complete information about their body functions, sex, safer sex, reproduction, and sexual negotiation and refusal skills. Without information, adolescents are forced to make poorly informed decisions that may have profound negative effects on their lives. Although health workers are likely not to be adolescents' primary source of information about puberty, sexuality, and the consequences of sexual behaviour, they are nonetheless credible sources of such information in the eyes of adolescents and their parents.^{11,59} However, health providers can have a particular role in identifying

problems associated with pubertal development and allaying adolescents' concerns about normal variation.⁶⁰

For young people contemplating or already engaged in sexual activity, clinicians play a central part in the provision of contraception and counselling around sexual decision-making and behaviour.⁶¹ In general, with the exception of male and female sterilisation, all methods used for healthy adults are also potentially appropriate for healthy, post-pubertal adolescents. In other words, once puberty has been achieved, methods that are physiologically safe for adults are also physiologically safe for adolescents. However, as with adults, informed decision-making about contraceptives entails consideration of more than just medical safety. Before selecting contraceptive options, several issues warrant consideration: the nature of the sexual relationship and behaviours in which the individuals are engaged, frequency of intercourse, risks of STIs and HIV, efficacy of contraceptive method, ability to comply with use, ability to tolerate side-effects, availability of services, costs and convenience, religious beliefs, partners' attitudes, and other personal factors. If sexual activity is infrequent or multiple partners are likely, condoms may be a priority. Emergency contraceptive pills are an option in the event of condoms breaking or slipping, or other causes of unprotected intercourse. Individuals who engage in frequent intercourse may opt for other methods to protect against pregnancy, but still need to routinely use condoms to prevent against STIs and HIV.

The most common route to risky sexual intercourse for adolescent girls in developing countries is through marriage. In most countries, married adolescent girls have more unprotected intercourse, have sex more frequently, and are less likely to protect themselves than unmarried adolescent girls.⁹ Over the next 10 years, an estimated 100 million girls will marry before their 18th birthday. They represent a third of adolescent girls in developing countries, excluding China. The low status of adolescent girls and their lack of income means that they are dependent on others—typically husbands or mothers-

	Female	Male
Sub-Saharan Africa	6.9%	2.1%
Mali, 2001	1.5%	0.5%
Kenya, 2003	6.0%	1.5%
Zambia, 2001-02	11.0%	3.0%
Zimbabwe, 2001-02	8.0%	5.0%
North Africa and Middle East	0.2%	0.1%
Asia	0.3%	0.4%
Eastern Europe and central Asia	0.6%	1.3%
Latin America	0.5%	0.8%
Caribbean	2.9%	1.2%
North America and western Europe	0.1%	0.2%

Table 3: Prevalence of HIV-infection in 15-24-year-olds by region, 2003⁴

in-law—for access to care.⁶² Many of these young wives become pregnant; more than 90% of the 14 million births to adolescents are in developing countries, most within the context of marriage.

Antenatal, perinatal, and postnatal care

Pregnant adolescents need appropriate prenatal and delivery care to prevent death and disability.⁶³ In developing countries, maternal death rates for those aged 15–19 years are twice that of older women.⁶⁴ Yet, as for their older counterparts, obstetric and neonatal outcomes for adolescents can be improved if comprehensive antenatal care emphasising specific medical, nutritional, and social aspects of adolescence is available. Antenatal care should start in the first trimester of pregnancy or early in the second trimester. The components of this care need not be different from those provided for adult women. However, the care should be adapted to the needs of a young person, irrespective of whether the pregnancy occurs within or outside of marriage. Adolescents often enter pregnancy with reduced nutritional stores, threatening fetal and maternal health. Iron and nutritional supplementation during pregnancy is an important component of antenatal care, particularly to help increase the gestational age and weight of the infant at birth.

Most pregnant adolescents should not be considered at high risk during labour. If the pregnancy is uneventful, complications such as anaemia are treated adequately, labour starts at term (37–42 completed weeks of gestation), and the infant is in cephalic presentation, then the adolescent mother in labour is not at increased risk; birth can take place at the most peripheral level at which appropriate care is feasible and safe. However, special attention is needed for pregnant adolescents aged 14 years or younger. Postpartum care is especially important in order to diagnose and treat complications such as haemorrhage or infection and also to provide contraceptives to prevent or delay another pregnancy, to promote and support breastfeeding, and to give nutritional advice and immunisation.⁶⁵

STI diagnosis and treatment

One problem in the prevention and control of STIs, especially in adolescents, is that many individuals remain asymptomatic until serious sequelae occur.² This difficulty, combined with adolescents' variable knowledge about STIs and hesitancy to seek health services because of embarrassment or guilt, reduces the likelihood of successful treatment. Centres and clinical programmes that have been able to manage substantial numbers of STI cases in adolescents are those that have attracted individuals at high risk (eg, sex workers), define STI services as a high priority, and ensure adequate drug supplies for treatment.^{2,54}

The role of health services in protecting adolescents from HIV/AIDS is of crucial importance. An internationally-applicable, evidence-based package of clinical

services has been defined as: providing information and counselling, addressing risk reduction (condom provision and harm reduction for injecting drug users), and diagnosing and treating STIs and HIV/AIDS.^{2,53,54} With the prospect of increased provider-initiated HIV testing⁶⁶ and male circumcision,⁶⁷ issues of consent and adequate provision of follow-up services for adolescents needs to be addressed urgently, particularly as the policies of many countries have provisions for consent, specifying age, parental or spousal agreement, or both.⁶⁸

Barriers to accessible, quality, and youth-friendly care

Barriers to adolescents' use of health services as well as approaches to overcome them have been well described and are the focus of another article in this Series.⁶⁹ Adolescents, who as a group are generally healthy, are less apt to see the need for care and may not seek services even when worried about a health problem. They may also avoid seeking health care for fear of being chastised, stigmatised, or punished for sexual involvement.^{59,70} A systematic review of interventions that increase use of sexual and reproductive health services in developing countries include those that provide training for service providers, make changes to the facilities, and promote the services with adolescents and gatekeepers in communities.⁵⁵

In developing countries where Pap smears are unavailable or socially unacceptable, the potential reduction in deaths from cervical cancer by HPV vaccination during adolescence could be substantial.⁷¹ With such new strategies for prevention and treatment on the horizon, in addition to the challenge of reducing the burden of disease caused by other health problems acquired during adolescence, clinic settings urgently need to discover and launch more effective ways of reaching increased numbers of adolescents, especially populations that are most vulnerable to specific health problems associated with unsafe sexual behaviour.

Sex education programmes

Sex education programmes grounded in evidence-based approaches are a cornerstone in reducing adolescent sexual risk behaviours and promoting sexual health.⁹ In addition to providing accurate information about consequences of STIs and early pregnancy, such programmes build life skills for interpersonal communication and decision making.^{72,73} Such programmes are most commonly implemented in schools, which reach large numbers of teenagers in areas where school enrollment rates are high. However, since not all young people are in school, sex education programmes have also been implemented in clinics, juvenile detention centers and youth-oriented community agencies. Notably, some programmes have been found to reduce risky sexual behaviours when implemented in both school and community settings with only minor modifications to the curricula.^{74,75} Consequently, public-

health officials and policymakers might seriously consider curriculum-based programmes as an important component in efforts to achieve regional and national goals for preventing HIV, STIs, and early pregnancy in young people.

In a review⁷⁶ of the effect of 83 evaluated sex education programmes, including 18 in developing countries, data were generally reported for one or more of five sexual behaviours: sexual initiation, frequency of sexual intercourse, number of sexual partners, condom use, and contraceptive use. A few studies reported pregnancy and STI rates. This review showed substantial evidence that curriculum-based programmes can have positive effects on risky sexual behaviours in young people. About two-thirds (65%) of the studies found a significant positive effect on one or more reproductive health outcomes; only 7% found a significant negative effect. A third (33%) of the programmes had a positive effect on two or more outcomes. Patterns of findings were very similar across developing and developed countries. Programmes were effective with both low-income and middle-income youth groups, in rural and urban areas, with girls and boys, with different age groups, and in school, clinic, and community settings. The findings showed that effective programmes shared 17 common characteristics, highlighted in the panel. These characteristics relate to the development, implementation, and content of the curriculum. Programmes that incorporated these characteristics were much more likely to reduce risky sexual behaviours than were programmes that did not incorporate many of these characteristics.⁷⁶

Findings indicate that the effects of curriculum-based programmes are quite robust with different types of young people, and across communities, countries and cultures throughout the world. However, robustness should not be confused with magnitude. Typically, effective sex education programmes reduced the amount of sexual risk taking by a third or less. In isolation, few programmes have a significant effect on STIs or pregnancy rates.⁷⁶ In view of the broader determinants of sexual behaviour (eg, poverty, unemployment, social norms), approaches that focus exclusively on changing individual behaviours are unlikely to produce substantial improvements in reproductive health status.⁹

Despite enormous progress over the past 20 years in the development of effective sex education programmes, substantial challenges remain. One is to implement, far more broadly, programmes that show strong evidence of reducing risky sexual behaviours. Although the issue is on the agenda of ministries of health and education in most countries, implementation of sex education programmes is often weak or constricted to only one aspect of reproductive health—eg, HIV information but not prevention of STIs or pregnancy.² To substantially reduce unintended pregnancies and transmission of HIV and STIs, a second challenge is to develop multipronged public-health approaches that not only affect individual

behaviours, but also address social contexts and structural factors that act against safe sex.⁹ Curriculum-based sex education programmes are not a complete solution to these problems, but are certainly an effective component of larger efforts.^{76,77}

Youth development and promotion of protective factors

A decade of evidence gathered worldwide has emphasised the usefulness of investing in youth development strategies for improving the short-term and long-term health of adolescents, including reproductive health.^{78,79} Data repeatedly show the effectiveness of investment in aspects of adolescents' lives that can protect them from harm and prepare them for effective entry into adult roles. Surrounding young people with protective factors, strengths, or assets in their social and environmental contexts—which is the primary focus of youth development—could achieve even greater improvements in outcome than focusing on reduction of risk.^{80,81} Youth development strategies promote opportunities for adolescents to build skills and competencies that allow them to function and contribute in the course of their daily lives, within the context of safe and supportive environments. This framework and set of approaches is being translated by various UN agencies and many youth-oriented non-governmental organisations into efforts for improving adolescents' successful completion of basic or primary school and, for some, secondary school, as well as expanding their capacity for assuring their livelihood and economic security, coupled with opportunities for positive engagement.⁷

Youth development means engaging adolescents in various ways. Some use school settings where adolescents could be involved, for example, in service learning, whereby participants develop and implement community service activities that centre on the acquisition of new skills, and opportunities to use those skills to be of help or service to others.^{11,73} When coupled with regular opportunities for reflection and dialogue about those experiences, service-learning approaches have resulted in sustained reductions in behaviours that jeopardise health for girls and boys.⁸² Other engagement strategies emphasise activities with same-age groups (eg, educating peers about health promotion) or with younger or older age groups (eg, tutoring younger children or reading to elders). Some youth development efforts use work settings for learning vocational skills and community-based programmes, contributing energies toward improving their neighbourhoods and villages (eg, creating safe places for children to play, planting gardens). Other strategies come from clinic settings, in which young people may participate in aspects of clinic management or offer health education sessions with peers, one-to-one or in small groups. All these efforts not only seek to enhance

Panel: Characteristics of effective sex education programmes**Curriculum development**

- 1 Involved people with different backgrounds in theory, research, and sex education
- 2 Planned specified health goals and identified behaviours affecting those goals, risk and protective factors affecting those behaviours, and activities to address those factors
- 3 Assessed relevant needs and assets of target group
- 4 Designed activities consistent with community values and available resources (eg, staff skills, staff time, space, supplies)
- 5 Pilot-tested curriculum activities

Content of curriculum

- 1 Created safe social environment for youth participants
- 2 Focused on at least one of three health goals—prevention of HIV, of other STIs, and/or of unintended pregnancy
- 3 Focused narrowly on specific sexual behaviours that lead to these health goals (eg, abstaining from sex, using condoms); gave clear messages about these behaviours; addressed how to avoid situations that might lead to these behaviours
- 4 Targeted several psychosocial risk and protective factors affecting these behaviours (eg, knowledge, perceived risks, attitudes, perceived norms, self-efficacy)
- 5 Included multiple activities to change each of the targeted risk and protective factor
- 6 Used teaching methods that actively involved youth participants, and helped them to personalise the information
- 7 Made use of activities appropriate to the young people's culture, developmental level, and previous sexual experience
- 8 Addressed topics in a logical order

Curriculum implementation

- 1 Selected educators with desired characteristics, and provided training in curriculum
- 2 Secured at least minimum support from appropriate authorities (eg, ministry of health, school district, community organisation)
- 3 If needed, implemented activities to recruit youth and overcome barriers to their involvement in programme
- 4 Implemented virtually all curriculum activities with fidelity

Adapted from Kirby and colleagues.⁸⁵

connections to family, schools, and positive peer groups, but also help adolescents to acquire skills for future employment and involve them in positive experiences that will enhance their transition from adolescence to adulthood.⁷⁷

International evidence on the usefulness of these approaches is persuasive. Return on investment is increasingly high for young people entering labour markets with secondary and tertiary schooling, further enhanced by opportunities that increase readiness for work in terms of skills and motivation.⁸³ Although laudable, this development is not enough in an increasingly complex world economy. To meet the growing demand for secondary and higher education that translates into work-applicable skills, continued emphasis is needed on assurance of high-quality education along with preparation for global economic competition as part of effective youth development strategies.⁸⁴

Evaluation and monitoring of strategies

For UN agencies and non-governmental organisations alike, the capacity to monitor and evaluate the efficacy and effectiveness of clinical services, sex education, and youth development programmes has moved to the forefront. The creation of evaluation plans based on logic models is important to substantiate the value of investing in prevention and health promotion.⁸⁵ These models need to show the movement from long-term goals and short-term objectives, aimed at improving specific health indicators, to strategies for measuring them. Moreover, attention must be given to the social contexts of interventions, to understand how and why approaches work.⁹ The use of relevant outcome indicators (eg, reduction in STIs or pregnancies, or rates of school completion) and appropriate process or monitoring measures (eg, numbers of adolescents involved in peer education or service learning, or youth workers participating in in-service training), coupled with credible evaluation designs, can provide valuable insights about the relation between critical inputs and desired outcomes. Such documentation is essential for the kind of advocacy that will result in local and country-level investment in the health of adolescents, the setting of youth-oriented priorities for resource allocation and programming, and, ultimately, sustaining an agenda that focuses on protecting and promoting adolescents' health and wellbeing.²

Worldwide outlooks for improving adolescents' sexual and reproductive health

The goals of the 1994 International Conference on Population and Development in Cairo recognised reproductive rights as among fundamental human rights and put universal access to safe, affordable, and effective reproductive health care on the international agenda for the two following decades.⁸⁶ Sexual and reproductive rights refers to the rights of individuals, who are free of coercion, to the highest attainable standard of sexual health, and a satisfying and safe sexual life, and to be able to choose their partner, whether or not to be married or to be sexually active, and to decide when to have children. It requires access to health-care services and sexuality education.⁸⁷ This gathering of 179 countries acknowledged that the key to addressing the pressing problems of poverty, hunger, disease, environmental degradation, and political instability was securing women's sexual and reproductive health and rights—noting, however, that few of the recommendations from this seminal meeting focused specifically on the rights of adolescents.⁸⁶

Nearly a decade and a half later, what progress has been made toward achieving these goals for reproductive rights? Whereas sexual and reproductive health issues were distributed between various Millennium Development Goals (MDGs; eg, maternal health, child mortality, HIV/AIDS goals), none of these goals focused specifically on family planning.³⁵ Subsequently, several

international health summits have strongly responded to this omission. For example, in its advisory capacity to the United Nations Secretary-General, the UN Millennium Project called for “a massive scale up and expansion of family planning, maternal health, and HIV/AIDS prevention efforts throughout the developing world by mobilizing political will, institutional capacity and technical and financial resources”. They advised that assuring sexual and reproductive rights is key to achieving the MDGs.⁷⁷

Since the 1994 priority-setting conference, underfunding, destabilisation resulting from warfare and civil unrest, and the ravages brought about by HIV/AIDS have hindered advancement towards these goals. Although funding has increased for HIV/AIDS, it has come at the expense of resources dedicated to other reproductive health needs. The political controversy surrounding abortion and abortion services, strongly affected by the USA, has meant a shift away from evidence-based strategies and diminishing resources for reproductive health services, particularly harmful where family planning needs depend on foreign support.⁸⁹

Yet, signs of progress have appeared since 1994: more women have access to contraception, more girls are in school, more programmes are implementing curricula on sex and HIV education,⁷⁷ and the media worldwide shows increasing evidence of reproductive health messages, perhaps pointing to greater openness about sex and sexuality.⁹⁰ In short, progress toward reproductive rights in developing countries follows patterns similar to those in developed countries. But in developed and developing countries alike, adolescents as a group are at a disadvantage because they are not a high priority when resources are allocated.

Policies of UN agencies, however, have helped to advance the reproductive health agenda, including that for adolescents. During the decade after the conference in Cairo, many countries on several continents—eg, Bangladesh, Botswana, Brazil, India, Jordan, Malawi, Mexico, Nepal, Nigeria, Senegal, and Uganda—have moved forward with national policies focused on various aspects of adolescents’ reproductive health.^{11,90,91} Moreover, the 2004 World Health Assembly adopted a five-part strategy, based on the Cairo agenda, for accelerating the trajectory toward health: strengthening health systems capacities, improving information for priority setting, mobilising political will, creating supportive legislative and regulatory frameworks, and strengthening monitoring, evaluation, and accountability systems.^{2,56,79,90}

The next steps

Although there are signs of progress, continued worldwide investment is needed to prevent early pregnancy, STIs, and the spread of HIV in adolescents. Evidence provides consistent direction as to the next steps towards these goals.

All strategies designed for adolescents must be tailored to the unique developmental needs of young people and to the contexts and cultures in which they live. Health providers, teachers, and programme leaders all need specific knowledge and skills to assess and respond to the unique needs of this age-group. Young people need access to quality clinical services that offer effective treatments and vaccines, coupled with sex education that gives medically accurate information and teaches skills for negotiating sexual choices. Along with these two critical components, youth development programmes should connect adolescents with supportive adults and with educational and economic opportunities. And, for all cultures, communities, and countries, multifaceted approaches connecting multiple sectors show the greatest promise for success. As Wellings and colleagues⁹ wrote, “The diversity of sexual behaviour demands a range of prevention strategies.” So, too, does the diversity of social contexts in which sexual behaviour occurs.

Health providers, teachers, and community programme leaders, by nature of their expertise and work settings, may be most attuned to avenues of prevention that focus on individual behaviours and outcomes (eg, clinic services and sex education). However, we should balance these individual-focused interventions with equal emphasis on broader initiatives that address structural determinants of health in populations, and work to create supportive environments with policies and priorities that pay heed to the social contexts in which adolescents live.⁹ Advocates for systems change need to work with health providers to meet the goals set by the 1994 Cairo Conference, the MDGs, and worldwide aspirations for the healthy development of adolescents.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgments

Molly Secor-Turner assisted with the review of published work; Jenna Baumgartner provided editorial assistance. J Ferguson is a staff member of WHO. The authors alone are responsible for the views expressed in this publication, which do not necessarily represent the decisions, policy, or views of WHO.

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