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Evaluating the need for sex education in developing countries: sexual behaviour, knowledge of preventing sexually transmitted infections/HIV and unplanned pregnancy

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Young people's need for sex education is evidenced by their typically early initiation of sexual activity, the often involuntary context within which they have sexual intercourse, high-risk sexual behaviours and the inadequate levels of knowledge of means of protecting their sexual health. The earliness of initiation of sexual intercourse has implications for the age by which sexuality education should be provided. The extent and context of sexual behaviour is a firm indicator of the need for sex education as well as for counselling, information and services related to sexual and reproductive health. Apart from behaviours, information on the extent of knowledge and accuracy of knowledge about risks to sexual health and about means of preventing unhealthy or undesired outcomes are important indicators of young people's need for information to help them make choices and to engage in safe and healthy behaviours. Such measures of behaviour and knowledge can also be relevant and valid indicators of the effectiveness of sex education interventions. The context with which young people live and key characteristics such as school attendance and literacy are important considerations in providing information and in evaluating interventions.

Introduction

This paper has three main goals. First, it aims to highlight key contextual factors that influence how sex education can reach and benefit young people. It also provides evidence on selected key indicators of behaviours and knowledge among young people in sub-Saharan Africa, Latin America and the Caribbean. Information is presented separately for young men and women. Finally, the paper uses this evidence to highlight the nature and extent of need for sex education among young

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people in these regions, and the advantages and disadvantages of indicators commonly used to measure effectiveness of programmes and interventions.

Evaluations of sex and relationship education have used many types of outcomes to measure effectiveness. Aggregate measures for a group—pregnancy, birth or sexually transmitted infection (STI) rates—may be appropriate for some interventions; more often, however, individual-based indicators are more suitable—for example, knowledge of sources of risk and means of protection, and behaviours such as delaying age at first intercourse, use of a method at first intercourse, having ever used and currently using contraception or the condom. Indicators that may also be relevant for assessing effectiveness of some sexuality education programmes or interventions but that are used less often include attitudes towards sexual satisfaction and pleasure, young people's sense of mutuality and respect in sexual relations, and gender differences in sexual attitudes and experience. The data presented here for the most part do not include measures of these important indicators, but do provide evidence of gender differences in sexual experience, knowledge of means of transmission and prevention of HIV, and knowledge of contraceptive methods including the condom. This paper aims to provide a better sense of the range, utility and limitations of indicators that are already being commonly measured. Information on known problems or data quality issues with current measures of outcomes and on the quality and limitations of particular questions and measures is useful for researchers seeking to select indicators to assess interventions and their impacts.

Data sources, methods and quality of data

Data sources

The data reported on here come from 30 nationally representative sample surveys (the Demographic and Health Surveys [DHS]) that have been carried out by Macro International in collaboration with in-country government agencies. We include only those countries that have collected information for both young men and women, and that surveyed both married and unmarried young people. We exclude countries that have surveyed ever-married samples, because of the incompleteness of such surveys for analysing the behaviour of young people, a substantial proportion of whom are unmarried in most countries. There are 24 countries in sub-Saharan Africa and six countries in Latin America and the Caribbean with the necessary data. These surveys were conducted between the mid-1990s and 2003.

The survey design and questionnaire content are highly comparable across countries, given the implementation of standard approaches and technical assistance provided to countries by Macro International. Total sample sizes for the surveys of women are relatively large, and the total number of interviewed women aged 15–19 is over 1000 in all but four countries (Côte d'Ivoire, Dominican Republic, Ghana and Tanzania), where it is under 900; the sample size is between 1500 and 2000 in nine of the 30 countries, and is over 2000 in 10 countries. Sample sizes are, however,

much smaller for men. The number of interviewed men aged 15–19 in the surveys ranges between 176 (Côte d'Ivoire) and just under 900 (Togo); it is between 600 and 900 in 13 of the 30 countries. As a result, estimates for men have a larger sample error than estimates for women. In addition, because the percentage of young men who are in union is very low, the number of young men in union is too small for analysis (less than 30 respondents in all but two countries, in which the number is 50 or less).

The focus here is on young people and present survey data are presented as reported by 15–19 year olds. We also use data from older respondents on an indicator of more generally held public attitudes.

Measures and methods

The DHS surveys collect information on whether respondents ever had intercourse and the age at first intercourse and first marriage or union. Selected indicators of sexual behaviour are presented here for young men and women: the proportion currently in a union, the proportion who ever had intercourse among all young people, and the proportion who have ever had intercourse among those who are not in a union.

The DHS questionnaire asks a standard series of questions about contraceptive knowledge and use. In this paper we examine overall measures of knowledge of contraceptive methods that include both spontaneous and probed reporting of specific methods. We group together modern methods with low failure rates (defined to include sterilization, intra-uterine device [IUD], hormonal methods [norplant, injectables, the pill] and the diaphragm), and present knowledge of the condom separately because of the unique importance of the condom as a means for the prevention of sexually transmitted diseases and HIV/AIDS. Knowledge of contraception was examined according to whether young people were sexually experienced or not, because many factors, including relevance of information and motivation to remember what is taught, can differ according to whether an individual has become sexually active or not.

The tendency of some survey respondents to conceal or, in some cases, over-report their sexual behaviour in large-scale surveys is acknowledged and should be borne in mind (Blanc & Rutenberg, 1990; Udry, 1990; Ferry, 1993; Dare & Cleland, 1994; Basu, 1994; Morris *et al.*, 1993; Becker *et al.*, 1995; Huygens *et al.*, 1997). Many survey respondents do not or cannot always openly or truthfully answer questions dealing with sexual behaviour and practices. Young people, especially if they are unmarried or live in settings where sexual relationships outside of marriage are censured, are probably even more likely than more mature adults to be reticent about this area of their behaviour. And very young teenagers, who are only just beginning to develop a sense of their own sexuality, are probably even less likely to want to discuss this aspect of their lives. On the other hand, the opposite problem may be encountered where, as some research has suggested, young men over-report sexual activity because they think that it reflects positively on them. As a

result, we only comment on large differences in the reported behaviours of young men and women.

Despite its limitations, the information presented here provides the best available, recent and nationally representative measures of sexual behaviour and of knowledge of protective behaviours among young people in a wide range of countries. Some types of reporting problems should be less severe in this analysis of young people, because the experience they are reporting on is relatively recent, and reporting should be less affected by difficulty in recalling ages or dates of events.

Although survey information on sexual behaviour obtained through personal interviews undoubtedly suffers from certain types of misreporting, levels of non-response to questions on age at first intercourse or timing of recent sexual intercourse have been found to be quite low, typically under 5% (Blanc & Rutenberg, 1990). This suggests that, in general, respondents are not as uncomfortable discussing the issue as had previously been believed and are usually willing and able to answer questions of this type.

However, these surveys are of all persons of reproductive ages—typically women aged 15–49 and men aged 15–54. The surveys are not focused on young people alone, and therefore fieldwork approaches cannot be adapted entirely to the special needs of youth.

Key findings

Contextual factors influencing sex education

The context within which young people live affects the potential for reaching them with sexuality education programmes and interventions. It also influences the choice of the most effective means or the channels through which such education can be delivered, and therefore has relevance for the design and implementation of interventions.

In some countries, the fact that a high proportion of young people do not attend school rules out school-based sexuality education for all but a minority of young people. This is the situation for young women in the large majority of countries in sub-Saharan Africa, and also for young men in a good number of countries in this region, although proportions in school are somewhat higher for young men in general (Table 1, columns 1 and 5). Even in Latin America, one-quarter to one-third of young people in the age group considered in this paper are not in school.

The proportion of young people with some secondary schooling varies widely within and across these two developing regions. It is under 20% in several countries of sub-Saharan Africa, and is 60% or more in a handful of countries (Ghana, for young men in Nigeria, Kenya, Namibia, South Africa and Zimbabwe; Table 1, columns 2 and 6). This indicator is clearly related to the prior measure (proportion currently attending school), but it further indicates the extent of constraints on how and what types of sexuality education information can be communicated to young people.

The proportion of young people living in urban areas is relevant because many interventions are easier to implement effectively and efficiently in urban areas. There

Table 1. Selected demographic and social characteristics of 15-year-old to 19-year-old women and men in sub-Saharan Africa and Latin America and the Caribbean

Country, survey year	Women				Men			
	In school (%)	With 7+ years of schooling (%)	Urban (%)	No exposure to media (%)	In school (%)	With 7+ years of schooling (%)	Urban (%)	No exposure to media (%)
Sub-Saharan Africa								
West Africa								
Benin Republic, 2001	15[a]	22	47	34	U	41	46	12
Burkina Faso, 1999	9	9	21	70	17	18	23	58
Cote D'Ivoire, 1998	17	17	45	24	36	35	42	7
Ghana, 1998	38	64	37	23	49	70	31	19
Guinea, 1999	19	10	41	52	47	27	40	48
Mali, 2001	13[a]	12	41	27	27[a]	24	37	22
Niger, 1998	7	7	22	40	15	20	27	22
Nigeria, 2003	50[a]	48	34	34	63[a]	60	35	19
Togo, 1998	40	17	44	37	67	31	35	35
Central Africa								
Cameroon, 1998	35	49	39	49	55	51	46	29
Central African Republic, 1994	20	9	49	30	44	16	51	17
Chad, 1997	12	4	23	75	55	15	32	62
Gabon, 2000	70	50	83	12	84	57	82	7
East and southern Africa								
Ethiopia, 2000	U	13	22	81	U	14	16	69
Kenya, 1998	50	61	22	31	62	60	16	12
Malawi, 2000	32[a]	33	17	44	U	34	18	25
Mozambique, 1997	16	9	28	59	51	15	39	42
Namibia, 2000	69[a]	75	32	21	U	61	31	14
Rwanda, 2000	15[a]	9	21	57	U	8	19	40
South Africa, 1998	80	89	53	14	U	U	U	U

Table 1. (*Continued.*)

Country, survey year	Women				Men			
	In school (%)	With 7+ years of schooling (%)	Urban (%)	No exposure to media (%)	In school (%)	With 7+ years of schooling (%)	Urban (%)	No exposure to media (%)
Tanzania, 1999	26	44	24	72	32	46	26	58
Uganda, 2000/01	21[a]	35	19	42	49[a]	39	18	22
Zambia, 2001	33[a]	51	42	50	54[a]	50	36	39
Zimbabwe, 1999	39[a]	85	35	38	56[a]	82	29	27
Latin America and the Caribbean								
Bolivia, 1998	67	76	76	7	75	86	71	5
Brazil, 1996	65	52	81	2	66	43	75	2
Dominican Republic, 1999	77	82	71	1	78	74	61	11
Haiti, 2000	65[a]	33	51	25	74[a]	30	40	23
Nicaragua, 1997/1998	49	51	64	8	52	49	65	5
Peru, 1996	61	69	75	5	71	71	73	1

U, unavailable. [a]Data from an earlier survey used because the most recent survey lacks this measure for the following countries: Benin (1996), Haiti (1994), Malawi (1992), Mali (1996), Namibia (1992), Nigeria (1999), Rwanda (1992), Uganda (1995), Zambia (1996), and Zimbabwe (1994).

are likely to be more opportunities for bringing together groups of young people; for example, in community or youth centres in urban areas than in rural areas. Most sub-Saharan African countries are largely rural. However, the proportion of young people living in rural areas is much smaller in Latin America and the Caribbean, ranging from one-fifth to about one-third (Table 1, columns 3 and 7).

Radio, television and newspapers are other means of communicating information to young people. Here, we present a simple indicator, the proportion who has weekly exposure to at least one of these three types of media (Table 1, columns 4 and 8). While this proportion is very low in a few countries (30% or less among young women in Burkina Faso, Chad Republic, Ethiopia and Tanzania), it is generally higher in the rest of the region of sub-Saharan Africa. Young men are generally more likely to have exposure to the media than young women. Almost all young people in Latin America and the Caribbean, however, have exposure to the media.

These population-level characteristics have implications not only for the extent of reach and most effective means of providing sex education, but also for the evaluation of impact. They indicate that, depending on the type of sexuality education programme, the group of young people who receive a particular intervention will be selective, and their characteristics may affect the size of impact of the programme. For example, young people who are attending school may be selective on many grounds: they may be of higher socio-economic status, more motivated to engage in protective behaviours, more capable of obtaining services or supplies, and exposed to more sources of information including the mass media.

Young women who are married or in a union and those who are single and have already had a child, in addition to most probably not being in school, may not be considered to need sexuality education and may have few options in terms of where to obtain services, particularly where young married women are expected to have children soon after marriage. Nevertheless, this group is at considerable risk of unplanned pregnancy and STI/HIV. The barriers to reaching this group are therefore not only physical but also social and cultural. A substantial proportion of young women are married in sub-Saharan Africa (about 20–40% in many countries of this region), and in Latin America and the Caribbean as well, where typically 10–20% are married (Table 2, columns 2 and 4).

Given the often high levels of community opposition to the provision of sexuality education, it is important in planning such interventions, to take into account information on the extent of public support. Data are available on the proportion of young people and adults who agree that children 12–14 years old should be taught how to use the condom to avoid AIDS (Table 3). This measure was collected in a number of countries, but not all. The measure can be interpreted as a minimum indicator of acceptability of sex education, given the mention of avoiding AIDS. While quite high in most of the 12 countries for which data are available (two-thirds or more), there is some variation—with about one-half or fewer adults agreeing in two countries (Nigeria and Zimbabwe). In a few countries, adult women express more conservative opinions compared with men.

Table 2. Percentage who ever had intercourse and percentage in union[1], among men and women aged 15–19 in sub-Saharan Africa and Latin America and the Caribbean

Country, survey year	Women		Men	
	Ever had sex (%)	Currently in union (%)	Ever had sex (%)	Currently in union (%)
Sub-Saharan Africa				
West Africa				
Benin Republic, 2001	56	23	51	1
Burkina Faso, 1999	49	34	28	1
Cote D'Ivoire, 1998	64	24	56	1
Ghana, 1998	38	13	19	3
Guinea, 1999	60	44	51	2
Mali, 2001	64	46	34	1
Niger, 1998	63	60	26	3
Nigeria, 2003	51	32	25	1
Togo, 1998	61	19	43	2
Central Africa				
Cameroon, 1998	65	34	48	4
Central African Republic, 1994	62	39	52	6
Chad, 1997	55	47	36	5
Gabon, 2000	70	18	78	2
East and Southern Africa				
Ethiopia, 2000	31	23	15	1
Kenya, 1998	44	15	54	1
Malawi, 2000	57	33	61	4
Mozambique, 1997	69	45	65	3
Namibia, 2000	48	5	64	2
Rwanda, 2000	14	7	21	1
South Africa, 1998	44	3	U	U
Tanzania, 1999	53	25	57	2
Uganda, 2000	52	29	38	6
Zambia, 2001	57	24	63	1
Zimbabwe, 1999	32	22	29	1
Latin America and the Caribbean				
Bolivia, 1998	20	11	41	4
Brazil, 1996	33	14	64	3
Dominican Republic, 1999	32	18	48	3
Haiti, 2000	34	16	52	2
Nicaragua, 1997/1998	36	26	58	8
Peru, 1996	20	12	46	2

U, unavailable. [a]In union includes those who are legally married as well as those living together in consensual, common-law or cohabiting unions.

Levels of sexual activity

Large proportions of young people have ever had intercourse—male and female, and in both Sub-Saharan Africa and Latin America and the Caribbean regions (Table 2, columns 1 and 3). It should be borne in mind in interpreting this proportion that the

Table 3. Proportion of 20–49 year olds who have heard of HIV and believe that children aged 12–14[a] should be taught to use condoms to avoid AIDS, in sub-Saharan Africa and Latin America and the Caribbean

Country, survey year	Women aged 20–49	Men aged 20–49
Sub-Saharan Africa		
Benin Republic, 2001	69	69
Gabon, 2000	83	83
Malawi, 2000	55	68
Mali, 2001	69	66
Namibia, 2000	82	82
Nigeria, 2003	41	46
Rwanda, 2000	67	73
Uganda, 2000	65	59
Zambia, 2001	56	69
Zimbabwe, 1999	38	51
Latin America and the Caribbean		
Dominican Republic, 1999	90	U
Haiti, 2000	51	63

U, unavailable. [a]For Benin, the question was asked about children aged 12–16; for Gabon, the question was asked about children under the age of 15.

average age of this age group (15–19 year olds) is approximately 17.5 years (the midpoint of the age range). The proportion sexually experienced is particularly high among the majority of young women in many countries of sub-Saharan Africa, in large part because of early marriage in this region, given the substantial proportions of young women who are currently in union (Table 2, column 2).

Substantial proportions of young women are sexually experienced and not currently in a union, especially in sub-Saharan Africa (the difference between column 1 and column 2, Table 2). Almost all sexual experience among young men is outside of marriage or union (Table 2, columns 3 and 4): the proportion sexually experienced among young men is quite variable, particularly within sub-Saharan Africa, ranging from 25% or less in a few countries to more than one-half in a number of countries. There is greater uniformity in Latin America and the Caribbean, with a range of about 40–60% across the six represented countries.

The proportion of women aged 20–24 who become sexually active before age 15 (including initiation both before and within marriage or a union) is 20–36% in 12 of the 30 represented countries, and is under 10% in only six countries (data not shown). Initiation at this early age is less prevalent among young men compared with young women, especially in sub-Saharan Africa—presumably due to early marriage of women. The opposite pattern holds in Latin America, where initiation before age 15 is much higher among young men than among young women.

The earliness of initiation of sexual intercourse also has implications for the age by which sexuality education needs to be started, and more generally for the age by which information and services related to sexual and reproductive health begin to be needed. Moreover, sexuality education, to be most beneficial and most

effective, should precede, and if possible be provided well in advance of, sexual initiation.

The proportion of young people with multiple sexual partners is used as an indicator of level of potential risk of STIs/HIV. One indicator that is often used is the percentage of sexually experienced youth who had two or more partners in the past year. Among unmarried men who were sexually active in the past year, a substantial proportion of those aged 15–19 reported having had two or more sexual partners during the past year—20–40% in 12 of the 26 countries with this information, and 41–69% in 11 of these countries (DHS surveys, data not shown). The proportion with three or more partners in the past year is also substantial (20–47% in one-half of these 26 countries). Among women, the proportion with multiple partners is reportedly much lower than among men. However, in 13 of the 23 countries with data, 10–32% of unmarried women aged 15–19 who have been sexually active in the past year report having two or more sexual partners over the recent one-year period.

Knowledge and behaviours regarding risk and protection

Given that most young people will become sexually active during their adolescent years, whether within or before entry into a union or marriage, it is very important that they understand the factors that place them at risk for pregnancy and for STIs/HIV, to prevent unintended pregnancy and infection.

Recent surveys have not included questions on knowledge about the fecund period of the menstrual cycle. Surveys in the 1980s and early 1990s in a large number of developing countries did ask about this and the results showed that very high proportions of women could not identify which period of the menstrual cycle had the highest probability of pregnancy (Alan Guttmacher Institute, 1995).

Recent surveys have inquired about knowledge of means of transmission of HIV. We present data on two indicators, awareness that a healthy-looking person can have HIV and knowledge that HIV can be transmitted from mother to child. Seventy to 86% of young women in six of the 30 countries knew that a healthy looking person can have HIV/AIDS, while less than one-half had this knowledge in another seven countries; in the remaining 17 countries, 50–69% were aware of this fact (Table 4, column 1). The situation was slightly better among young men: over 70% knew that a healthy-looking person could have HIV/AIDS in 13 of the 30 countries, and only in three countries were less than 50% aware of this fact (Table 4, column 4). For both young women and men, knowledge that HIV can be transmitted from mother to child was at about the same level as the previous indicator (Table 4, columns 2 and 5). It is notable that, even in some high-HIV-prevalence countries, knowledge of these two basic facts is not very high: in Kenya about 25% of young people did not know, and in Ethiopia, Mozambique and Nigeria about one-half to two-thirds of young people did not know about one or both of these two facts.

With respect to knowledge of contraceptive methods, we present data on two indicators: knowledge of any effective modern contraceptive method and knowledge of the condom. Effective modern methods are defined to include the pill, injectables,

Table 4. Knowledge about HIV/AIDS and condom source among 15-year-old to 19-year-old women and men in sub Saharan Africa and Latin America and the Caribbean

Country, survey year	Women			Men		
	Know a healthy-looking person can have HIV/AIDS (%)	Know that HIV can be transmitted from mother to child (%)	Sexually experienced who know where to get a condom (%)	Know a healthy-looking person can have HIV/AIDS (%)	Know that HIV can be transmitted from mother to child (%)	Sexually experienced who know where to get a condom (%)
Sub-Saharan Africa						
West Africa						
Benin Republic, 2001	53	68	38	68	70	81
Burkina Faso, 1999	37	39	29	58	49	88
Cote D'Ivoire, 1998	61	72	71	67	62	97
Ghana, 1998	65	74	71	71	U	88
Guinea, 1999	60	59	22	51	54	68
Mali, 2001	45	45	23	56	53	61
Niger, 1998	19	23	8	36	37	48
Nigeria, 2003	46	46	21	56	53	76
Togo, 1998	63	69	49	67	78	74
Central Africa						
Cameroon, 1998	55	63	57	56	63	88
Central African Republic, 1994	53	63	43	66	74	U
Chad, 1997	17	32	8	27	43	35
Gabon, 2000	69	84	74	78	87	90
East and Southern Africa						
Ethiopia, 2000	39	55	15	49	65	U
Kenya, 1998	67	79	46	74	78	77
Malawi, 2000	82	61	75	87	65	89
Mozambique, 1997	34	U	24	54	U	45
Namibia, 2000	79	86	89	85	88	88

Table 4. (*Continued.*)

Country, survey year	Women			Men		
	Know a healthy-looking person can have HIV/AIDS (%)	Know that HIV can be transmitted from mother to child (%)	Sexually experienced who know where to get a condom (%)	Know a healthy-looking person can have HIV/AIDS (%)	Know that HIV can be transmitted from mother to child (%)	Sexually experienced who know where to get a condom (%)
Rwanda, 2000	58	71	35	62	77	74
South Africa, 1998	52	U	88	U	U	U
Tanzania, 1999	60	68	47	63	65	72
Uganda, 2000	72	81	64	80	80	54
Zambia, 2001	69	76	75	66	68	79
Zimbabwe, 1999	69	81	65	81	84	87
Latin America and the Caribbean						
Bolivia, 1998	63	U	57	70	U	84
Brazil, 1996	78	89	87	78	83	96
Dominican Republic, 1999	86	87	72	88	U	95
Haiti, 2000	63	71	69	71	67	87
Nicaragua, 1997/1998	73	U	65	77	U	87
Peru, 1996	68	77	68	73	84	88

U, unavailable.

norplant, an IUD and sterilization. Knowledge of the condom is presented separately because of special interest in this method as the only reliable means (other than a mutually monogamous relationship with an uninfected partner or abstinence from intercourse) of preventing infection STIs/HIV. We look separately at those who are sexually experienced and those who are not yet sexually active, with the expectation that being sexually experienced will be associated with higher levels of knowledge, given the greater need to use protection.

Overall, two-thirds or more of sexually experienced teenage women and men know of at least one modern method in most of the study countries; in a few sub-Saharan countries and in all of the included Latin American countries, this proportion is 87% or higher (Table 5, columns 1 and 5). However, there are a few exceptions in sub-Saharan Africa where this proportion is much lower: only 37% of teenage women (but 50% of teenage men) in Chad Republic knew of at least one modern method, and only 51–54% of sexually experienced teenage women in Central African Republic and Mozambique, and of the comparable group of men in Mozambique, did so. In a few sub-Saharan African countries, knowledge of modern methods is higher among sexually experienced men than women. In general, knowledge of the condom among sexually experienced teenage men was very high—90% or more knew about the condom in 19 of the 24 sub-Saharan countries with this information, and 95% or more did so in all of the six Latin American countries (Table 5, column 6). Among sexually experienced teenage women 90% or more knew about the condom in eight countries of sub-Saharan Africa, while less than one-half knew about the condom in Chad, Ethiopia, Mozambique and Nigeria. Levels were higher in Latin America, where proportions ranged from 74% to 100%.

As anticipated, young people who were not yet sexually experienced were generally less likely to know about contraceptive methods than those who were. For example, among adolescent women who were not sexually experienced, less than two-thirds knew of at least one modern method in 14 of the 24 sub-Saharan Africa countries, and this is true of teenage men in all but five of the 24 countries of this region with information on men (Table 5, columns 3 and 7). In Latin America, however, knowledge of modern methods and of the condom is nearly as high among those who are not sexually experienced as it was among those who are (Table 5, columns 4 and 8).

Although reported levels of knowledge were very high, there is concern that these measures are measuring only a general awareness—'have heard of' these methods—and that they do not capture knowledge of how to use the method correctly, how to negotiate use with a partner and where to get the method. Information is available on knowledge of a source where the condom can be obtained (Table 4, columns 3 and 6). In almost all countries, there is a large gap between the proportion of young women who have heard of the condom and the proportion who know where to obtain it. In most countries, although there is a gap for young men, it is typically much smaller except for a few countries (e.g. Niger and Chad).

Reported levels of awareness of methods may over-estimate actual understanding of how to use methods correctly, however. For example, some small-scale studies have

Table 5. Knowledge of contraceptive methods among women and men aged 15–19 by sexual experience status[a] in sub-Saharan Africa and Latin America and the Caribbean

Country, survey year	Women				Men			
	Sexually experienced		Not sexually experienced		Sexually experienced		Not sexually experienced	
	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)
Sub-Saharan Africa								
West Africa								
Benin Republic, 2001	77	82	54	71	79	96	56	88
Burkina Faso, 1999	64	70	43	55	72	97	37	75
Cote D'Ivoire, 1998	84	90	58	87	73	100	46	91
Ghana, 1998	90	92	66	78	81	97	62	84
Guinea, 1999	64	62	57	61	73	92	27	58
Mali, 2001	72	65	54	57	81	94	49	69
Niger, 1998	67	33	61	43	84	88	62	66
Nigeria, 2003	61	52	41	54	67	95	38	76
Togo, 1998	87	90	67	76	86	98	59	88
Central Africa								
Cameroon, 1998	75	79	56	64	80	98	40	74
Central African Republic, 1994	54	66	29	37	61	95	23	72
Chad, 1997	37	26	24	19	50	75	18	40
Gabon, 2000	88	97	72	87	75	99	35	92
East and Southern Africa								
Ethiopia, 2000	79	29	63	34	79	70	64	53
Kenya, 1998	94	92	81	78	90	99	71	87

Table 5. (*Continued.*)

Country, survey year	Women				Men			
	Sexually experienced		Not sexually experienced		Sexually experienced		Not sexually experienced	
	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)	Report knowing effective modern methods[b] (%)	Condom (%)
Malawi, 2000	92	87	76	72	93	96	79	86
Mozambique, 1997	51	41	33	34	51	72	28	41
Namibia, 2000	97	96	77	90	93	100	70	97
Rwanda, 2000	79	89	49	80	77	97	45	90
South Africa, 1998	97	92	81	74	U	U	U	U
Tanzania, 1999	82	80	46	53	72	91	35	58
Uganda, 2000	94	90	80	80	88	98	78	94
Zambia, 2001	94	92	75	82	67	98	43	83
Zimbabwe, 1999	93	89	83	81	91	99	82	96
Latin America and the Caribbean								
Bolivia, 1998	87	74	84	77	91	95	74	81
Brazil, 1996	99	99	98	98	98	100	93	97
Dominican Republic, 1999	100	100	99	97	99	100	95	95
Haiti, 2000	99	97	92	88	97	99	79	87
Nicaragua, 1997/8	97	87	92	84	94	98	82	88
Peru, 1996	91	82	92	85	97	97	89	92

U, unavailable. [a]Sexually experienced defined as those who have ever had intercourse. [b]Effective modern methods defined to include sterilization, an IUD, norplant, injectables and the pill; excludes condom, which is separately shown.

looked at the level and quality of knowledge about condoms. A quantitative study among secondary and college students in Tanzania found that about one-half of respondents reported that condoms are not safe and can bring disease (Maswanya *et al.*, 1999). Another study among 10–24 year olds in Zambia found that only 47% of respondents agreed that condoms should be used during all sexual encounters to avoid HIV infection. Other studies have shown that although young people know about the condom, misperceptions are common; for example, the perception that condoms have small holes or they can disappear into the vagina (Feldman *et al.*, 1997; Nzioka, 2001), the low quality of condoms (Temin *et al.*, 1999)—especially condoms that are free (Meekers *et al.*, 2001)—and condom use signifying infidelity or having an STI (Swart-Kruger & Richter, 1997; Hulton *et al.*, 2000).

Knowledge of at least one way of preventing infection is very high in East and Southern Africa and in Latin America and the Caribbean, with a couple of important exceptions (Mozambique and Haiti). Its proportion is somewhat lower in West Africa than in other regions, with 35–60% of young women knowing at least one way in five out of nine countries (Table 6, columns 1 and 5).

However, knowledge of each of the three specific main ways of preventing HIV infection is much lower. Among both men and women aged 15–19, knowledge of abstinence is very low in West Africa, Central Africa and Latin America and the Caribbean, is moderate in East and Southern Africa, and is quite high in Malawi, Rwanda, Uganda and Zambia (Table 6, columns 2 and 6). Awareness of having only one faithful seronegative partner as a way of avoiding HIV infection is somewhat higher compared with knowledge of abstinence, in all regions except East and Southern Africa (Table 6, columns 3 and 7). As a means of prevention of HIV, the condom is more widely recognized than abstinence and monogamy, particularly in Latin America and the Caribbean, as well as in several countries in East and Southern Africa (Table 6, columns 4 and 8).

Implications and conclusions

What do the data tell us about the need for sex education?

The data presented here provide a nationally representative profile of young people's sexual behaviour in two regions of the developing world, Sub-Saharan Africa and Latin America and the Caribbean. The indicators typically available from this type of data source are important and useful, even though they are limited in scope given the type of data collection approach, and even though they suffer from some data reporting problems.

At a minimum, these data provide insights into the needs of young people for information, skills and services. The data reveal that high proportions of young people become sexually active during adolescence. Although not shown here, levels of outcomes that have a negative impact on health (STIs, HIV, pregnancy at a young age, unplanned pregnancy and births, and unsafe abortion) are high among young women and, in the case of STIs and HIV, among young men as well (Bankole *et al.*, 2004; National Research Council, 2005).

Table 6. Knowledge about ways to prevent HIV/AIDS among 15-year-old to 19-year-old young women and men in sub-Saharan Africa and Latin America and the Caribbean

Country, survey year	Women				Men			
	Know there are ways to avoid HIV/AIDS (%)	Spontaneously identified specific ways to avoid HIV/AIDS (%)			Know there are ways to avoid HIV/AIDS (%)	Spontaneously identified specific ways to avoid HIV/AIDS (%)		
		Abstain	Have only one partner	Use condoms		Abstain	Have only one partner	Use condoms
Sub-Saharan Africa								
West Africa								
Benin Republic, 2001	54	5	31	37	75	9	33	63
Burkina Faso, 1999	53	9	28	22	67	13	27	51
Cote D'Ivoire, 1998	92	18	54	52	93	19	28	72
Ghana, 1998	75	14	46	22	77	12	41	35
Guinea, 1999	77	34	55	27	79	37	20	51
Mali, 2001	54	14	20	35	71	22	17	54
Niger, 1998	35	8	18	10	58	22	10	27
Nigeria, 2003	60	19	23	11	76	30	14	28
Togo, 1998	68	10	28	39	84	22	21	61
Central Africa								
Cameroon, 1998	70	14	27	37	84	20	19	57
Central African Republic, 1994	62	12	38	28	79	10	38	46
Chad, 1997	35	11	21	7	55	25	19	20
Gabon, 2000	82	14	20	67	92	18	16	81
East and Southern Africa								
Ethiopia, 2000	67	11	45	21	80	20	52	39
Kenya, 1998	74	33	18	33	84	35	13	52
Malawi, 2000	92	65	19	55	96	69	11	73
Mozambique, 1997	26	1	19	14	40	1	15	28
Namibia, 2000	86	36	28	78	93	42	21	89

Table 6. (*Continued.*)

Country, survey year	Women				Men			
	Know there are ways to avoid HIV/AIDS (%)	Spontaneously identified specific ways to avoid HIV/AIDS (%)			Know there are ways to avoid HIV/AIDS (%)	Spontaneously identified specific ways to avoid HIV/AIDS (%)		
		Abstain	Have only one partner	Use condoms		Abstain	Have only one partner	Use condoms
Rwanda, 2000	93	78	10	34	95	81	3	63
South Africa, 1998	91	U	U	78	U	U	U	U
Tanzania, 1999	74	32	34	41	76	29	28	58
Uganda, 2000	85	53	37	56	93	67	29	74
Zambia, 2001	80	47	29	46	87	53	14	61
Zimbabwe, 1999	80	24	51	59	88	25	50	73
Latin America and the Caribbean								
Bolivia, 1998	68	14	40	35	75	13	33	55
Brazil, 1996	90	2	6	82	91	2	6	87
Dominican Republic, 1999	87	16	29	62	94	9	14	84
Haiti, 2000	54	12	17	39	74	17	19	58
Nicaragua, 1997/1998	76	8	18	49	86	7	13	68
Peru, 1996	70	10	25	32	80	6	20	53

U, unavailable.

At the same time, however, the results also indicate that large proportions of adolescents lack basic knowledge that is a prerequisite for protective behaviours (knowledge of contraceptive methods and the condom, and of means of transmission of HIV). Other research has shown that substantial proportions of young people engage in risky behaviours such as having multiple sexual partners, and has also shown that there are large gaps in the proportions engaging in protective behaviours (use of the condom and of effective means of preventing pregnancy, for example). Overall, these findings suggest that young people need to increase protective behaviours and decrease risky behaviours.

Increased provision of accurate and comprehensive sexuality education in these two regions is one factor that can contribute to bettering the sexual and reproductive health of young people. Although knowledge and skills gained through comprehensive sex education are not sufficient in themselves to result in good sexual health, they are necessary steps towards this goal. Even so, the large gaps between existing levels of knowledge and actual practice of protective behaviours argue that while better information through sex education will help, and is a necessary fundamental step for young people to engage in protective behaviours, it is most probably insufficient on its own to bring about this change. In addition to acknowledging the fact that change can be slow and incremental, and may take a number of years, it is important to look into what other barriers than lack of knowledge exist and may counteract young people's ability to act upon what knowledge they do have.

The information presented on the context of young people's lives (their education and school attendance, whether they live in rural or urban areas and their access to media) point to important constraints on the formats and approaches that can be used to reach which groups of youth. The importance of programmes and interventions that are directed to young people who are not attending school is reinforced by these findings. The need to find means of reaching rural youth, those who are illiterate and those who are not currently exposed to any form of modern media is also made clear. The logistical difficulties of doing so may be great, but need to be addressed. For example, radio, mobile cinema, street theatre, talks and other formats that do not use written language are potential methods of reaching those who are illiterate or in rural areas.

The behaviours documented here suggest some needed emphases in sexuality education that may not be immediately obvious—the needs of married young people and young mothers, for example. These groups of young people have an even more immediate need than do other young people, for knowledge and services regarding planning and spacing births, skills of communication with partners and husbands who are often much older, self-efficacy in terms of decision-making, and information on how to care for infants and on health and nutrition.

The findings on age at first intercourse indicate the need for sex education to begin at a minimum before age 15, and, to be most effective, significantly before this age. Other data that suggest sexual coercion is probably quite widespread and that it

occurs at quite young ages (Varga, 1999; Ghana Social Marketing Foundation *et al.*, 2000; MacPhail & Campbell, 2001; Jejeebhoy & Bott, 2003; National Research Council and Institute of Medicine, 2005) also reinforce the importance of teaching young people about what coercion is and of providing them with some skills of how to deal with and prevent this, and where they can turn for help.

The high proportions of young people who become sexually active during their adolescent years, whether before marriage or, for adolescent women, often within marriage, point to the fact that becoming sexually active in youth is normative behaviour. The substantial proportions of sexually experienced young people who have multiple sexual partners also suggest that such behaviour may be characteristic of this stage of life (Bankole *et al.*, 2004). The existing levels and patterns of sexual behaviour suggest that programmes need to be responsive to the needs implied by actual behaviour, even while they may also seek to promote choices including the decision to delay becoming sexually active, to stop being sexually active and to reduce the number of sexual partners. For example, young people who choose to be sexually active should have access to information on sources of contraceptives, particularly condoms, and how to use these methods to achieve maximum protection.

What do these data tell us about indicators for assessing the impact of interventions?

These data have some implications for evaluating future programmes and interventions on sex education. Many of the measures presented here have been used as indicators for assessing impact in studies evaluating interventions, and are indicative of the type and range of outcomes that can be used for this purpose (Speizer *et al.*, 2003).

An important factor to bear in mind, however, is that sensitive behaviours are often under-reported in face-to-face surveys of this kind, and that this will vary depending on the specific behaviour, the subgroup and the country. Basic measures such as 'ever had intercourse' and 'age at first intercourse' are likely to be under-reported, particularly by unmarried women, in very conservative societies or groups. In general, sexual activity is likely to be under-reported to a greater extent among young women than young men. There is also the possibility of over-reporting in some contexts—for example, adolescent men may over-report sexual experience in contexts where becoming sexually active at an early age and having multiple sexual partners are highly valued indicators of masculinity.

While different approaches and techniques of data collection make a difference and can reduce under-reporting (Mensch *et al.*, 2003), their feasibility for many interventions remains an issue. The issue of under-reporting may be less problematic if both the baseline and the post-intervention have the same degree of bias; however, even so, differential under-reporting across groups and over time may still affect evaluation results. It is also possible that the intervention itself may change willingness to report, and the analyst has to factor in this possibility in assessing impact, and perhaps include exploratory data collection to do so.

Some other indicators may be less sensitive—knowledge about methods and means of transmission and prevention, for example—and these are expected to be less subject to reporting problems. Measuring 'knowledge' in a sufficiently nuanced and specific way is crucial to assessing impact. Qualitative research techniques to explore what indicators are valid for a particular evaluation *and* can be measured accurately may be necessary in evaluations of programmes and interventions that are focused on sensitive behaviours.

Data on reported behaviours, and to some extent knowledge, show large differences between young men and women. It is possible that some interventions may inadvertently target young men only, as has been suggested in the case of some condom advertising campaigns in South Africa, for example (Crewe, 2004). In some contexts, young men may in fact be more knowledgeable because they have greater exposure to the media and education and to opportunities for learning through their greater access to public spaces. These differences argue for more attention to these kinds of effects.

Differences in risk behaviours may argue for different educational inputs, or for use of different outcome indicators in assessing effectiveness of interventions, even when the same inputs are used. For example, the higher level of multiple partners among young men than young women (unlikely to be explained away by differences in under-reporting) may be seen to support particular interventions for young men that emphasize understanding the mechanisms of transmission and protection against STIs. Alternatively, as both young men and women need this information, even though the intervention may not vary by sex, it may be appropriate to use number of partners as an outcome indicator for young men but not for young women who have less margin to see an effect. At a minimum, the data on differences in behaviour and knowledge suggest that evaluation studies should disaggregate assessment of impact by sex.

It is also possible that the best indicators for assessing the impact of a given intervention may differ across countries or population groups. For example, in a very conservative society, reporting on some issues may be very poor because of social barriers to discussing those issues: the intervention may have achieved an impact on knowledge or behaviour, but reporting may not capture the impact. Large discrepancies in reporting of condom use by men and women is considered to reflect the lower acceptability of women demonstrating knowledge of the condom, and more generally of sexual matters. It is possible that young men are 'allowed' to be more knowledgeable while young women are expected to show naïvety. These issues may not be insurmountable, but must be taken into account in selecting indicators and developing measures of indicators. A further factor to bear in mind is the desirability of increasing consistency and comparability of indicators to increase the possibility and ease of generalizing across studies when we evaluate the impact of sex education programmes and interventions.

When the prevalence of a behaviour that an intervention seeks to reduce is high, there is more room for achieving impact and it is easier and less costly (e.g. in terms of the sample size needed) to measure the significance of a reduction. In contrast, if

an indicator is very high and the intention is to increase it further (e.g. knowledge of effective contraceptive methods) there is less room to achieve impact, and measuring the impact with statistical significance is more difficult or costly. In some cases, there may be tension between statistical and substantive significance. For example, when the outcome of interest is rare or slow to change, small changes that may not be statistically significant may be of substantive importance; conversely, a statistically significant impact may actually be quite small in real terms, and not substantively important. In such cases, the evaluator needs to consider substantive importance in interpreting the meaning of findings on the impact of the intervention.

There are important constraints in using aggregate measures to measure impact, but individual outcomes also have limitations. By aggregate measures, we are referring to a measure such as a rate of an outcome for the group that is receiving the intervention. One important constraint is how common or rare the event that is being measured is. For example, a relatively high birth rate among young women is 100 per 1000 teens per year, and this rate is not based on those attending school only, but on the general population of 15–19 year olds. A study that seeks to test with 5% statistical significance for a 10% reduction in the birth rate would have include a very large study population because the change is in fact quite small, from 10% to 9% of the intervention group would have a child in a one-year period. STI rates are much lower than pregnancy rates and testing for change in this rate with statistical significance would be proportionally more difficult. Because of the well-recognized problem of high levels of under-reporting of abortion, even when methodologies to increase confidentiality and privacy are used, use of the pregnancy rate (the sum of the birth and abortion rates; miscarriages are usually estimated) as an outcome for testing the impact of a programme or intervention is extremely unlikely to yield valid results (Rossier, 2003; Singh *et al.*, 2003).

As the necessary study population increases in size, this raises the question of whether the intervention can be evenly administered across a very large set of groups; and if not, this will affect the impact achieved. In addition, other external factors that can affect the success of the intervention are more likely to vary as the study population (and the number of sites where the intervention is being carried out) increases in size and number.

Another kind of aggregate measure is the proportion of the group who experience an outcome, and the test is to see whether this proportion changes significantly or not as a result of an intervention. An example is the proportion who discuss condom use with their partner, or the proportion who use effective contraception. This kind of measure is less demanding in terms of sample size, but depending on the size of difference that the study is hoping to achieve and test to determine its significance, it may still require a relatively large study population.

Interpretation of patterns of change within the data that are collected to measure impact are an important part of assessing impact. Substantial impacts may be achieved in ways that are not measured by strictly statistically based techniques. Placing an intervention and its evaluation within a theoretical framework can greatly increase our ability to interpret and benefit from the results. It is also important to

consider the duration of time that may be needed to achieve an impact from an intervention or programme. Data over a sufficiently long period, even if they are cross-sectional, may be necessary to adequately assess impact. For example, it may take 10–15 years to see the impact of changes in attitudes and knowledge on behaviours. In addition, change in norms may proceed on a different timescale compared with change in the attitudes and behaviours of individuals.

Conclusions

The information reported here offers valuable guidance on the formulation of policy and programmes for the provision of sexual and reproductive health information and services to young people. The evidence on key behavioural indicators shows that a high proportion of young people initiate sexual activity during their teenage years, that there are important gaps in knowledge about contraception and other protective behaviours, and that a substantial number of young people engage in risky behaviours. These findings provide insight into the extent of the need for comprehensive sex education starting in the early teen years. Contextual factors, such as the relatively high proportion of young people in sub-Saharan Africa who do not attend school, the high proportion living in rural areas that are harder to reach, and the substantial proportions who do not have any exposure to media, have implications for determining how sex education can reach and benefit young people. In addition, reaching married teenage women and teenage mothers, groups that are at high risk for unintended pregnancies and STIs, and young men and women from poor families, many of who do not attend school or often drop out due to financial reasons, in most countries cannot be achieved through schools, as these subgroups of adolescents are no longer in school. These varied contexts suggest that a variety of approaches must be used, in addition to school-based education.

These data also provide insights that may be helpful in designing evaluations of the impact of interventions on sex and relationships education, as well as informing the choice of indicators for evaluating the impact of interventions. For example, choosing indicators that are less sensitive to reporting biases, even if they are not the first choice, may be necessary in some contexts. It is also possible that the best indicators for assessing the impact of a given intervention may differ across countries or population groups: data on reported behaviours, and to some extent knowledge, show large differences between young men and women. Such differences between young men and young women argue that evaluation studies should disaggregate assessment of impact by sex since the impact of interventions are likely to vary given the different starting points. More generally, the data presented here argue that contextual factors and key characteristics of outcome indicators—such as reporting bias and actual level—should be incorporated into the design of evaluations.

The indicators from large-scale survey data presented in this paper are useful in assessing the needs of young people for information and services related to protecting their sexual and reproductive health, and they also help inform the selection of outcome indicators for evaluation of interventions.

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