United Nations
Department of Economic and Social Affairs

Population Division

Expert Paper
No. 2011/12

THE IMPACT OF SEX EDUCATION ON THE SEXUAL BEHAVIOUR OF YOUNG PEOPLE

Douglas Kirby

This page is intentionally left blank

Population Division

Expert Paper
No. 2011/12

THE IMPACT OF SEX EDUCATION ON THE SEXUAL BEHAVIOUR OF YOUNG PEOPLE

Douglas Kirby
ETR Associates

United Nations New York, 2011

NOTE

The views expressed in the paper do not imply the expression of any opinion on the part of the United Nations Secretariat.

The term “country” as used in this paper also refers, as appropriate, to territories or areas.

The designations employed in this paper and the presentation of material do not imply the expression of any opinion whatsoever on the part of the United Nations Secretariat concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

This publication has been issued without formal editing.

LIST OF ACRONYMS

HIV	Human immunodefiency virus
AIDS	Acquired immunodeficiency syndrome

PREFACE

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat convened an *Expert Group Meeting on Adolescents, Youth and Development* at the United Nations Headquarters in New York, from 21 to 22 July 2011. The meeting was organised in order to commemorate the International Year of Youth established by resolution A/RES/64/134 of the General Assembly and as a preparatory meeting for the forty-fifth session of the Commission on Population and Development scheduled to take place in April 2012 and whose theme would be "Adolescents and youth".

The meeting brought together experts from different disciplines and regions to present and discuss research on two broad themes: (*a*) the demographic dynamics that shape the number and characteristics of adolescents and youth, and (*b*) the ways in which adolescents and young people can be agents of socio-economic development. Selected papers prepared by the experts participating in the meeting are being issued under the Expert Paper Series published on the website of the Population Division (www.unpopulation.org).

The Population Division is grateful to Mr. Douglas Kirby of ETR Associates in the United States of America for having participated in the meeting and prepared this paper, which focuses on a review of studies assessing the effectiveness of sex education programmes in reducing risky sexual behaviour among adolescents and young people. The paper concludes that sex education programmes that are based on a comprehensive curriculum can delay the onset of sexual activity among adolescents and young people, reduce the frequency of intercourse, reduce the frequency of unprotected sex, reduce the number of sexual partners, and increase condom and contraceptive use. Furthermore, sex education programmes do not increase sexual activity among adolescents and young people and generally result in increased knowledge about human sexuality. To be effective, sex education programmes need to provide unbiased and scientifically based information; explain the various practices and methods that can reduce the risks of pregnancy and of acquiring a sexually transmitted infection during intercourse; discuss values, perceptions and norms; and use methods validated by pedagogy and behavioural-change science to build the skills that adolescents and young people need in order to make responsible decisions about their sexual behaviour and follow through with those decisions.

The *Expert Paper Series* aims at providing access to government officials, the research community, non-governmental organizations, international organizations and the general public to overviews by experts on key demographic issues. The papers included in the series are mainly those presented at Expert Group Meetings organized by the Population Division on the different areas of its competence, including fertility, mortality, migration, urbanization and population distribution, population estimates and projections, population and development, and population policy. The views and opinions expressed in the papers published under this series are those of the authors and do not necessarily reflect those of the United Nations. The papers in the series are released without undergoing formal editing.

For further information concerning the papers in this series, please contact the office of Hania Zlotnik, Director, Population Division, Department of Economic and Social Affairs, United Nations, New York, 10017, USA, telephone (212) 963-3179, fax (212) 963-2147.

This page is intentionally left blank

THE IMPACT OF SEX EDUCATION ON THE SEXUAL BEHAVIOUR OF YOUNG PEOPLE

Douglas Kirby, ETR Associates

In most countries of the world, young people today spend more years in school than ever before in the history of humanity and, because girls and women not only get more education than ever before, but also seek to work before marrying, entry into marriage or cohabitation with a stable partner is occurring at later ages than in the past. At the same time, the evidence indicates that children are entering puberty earlier than decades ago, probably because of improved nutrition although other factors may also be at play. Thus, girls today have, on average, their first menstrual period (menarche) earlier than their mothers did and the onset of sperm development in boys is also occurring earlier than in the lives of their fathers. All those changes imply that the period from puberty to the entry into marriage or the formation of a stable union has been increasing in many countries. Moreover, those changes have occurred at the same time as societal norms regarding the practice of sex before marriage have become less stringent and access to effective modern methods of contraception has increased. Consequently, more young people are having sex before they marry and more young people are having several partners before marriage. As a consequence, young women are at higher risk of experiencing unintended premarital pregnancy and both young women and young men are at higher risk of contracting a sexually transmitted infection (STI), including the human immunodeficiency virus (HIV). These outcomes have major negative impacts not only on the lives of the young people concerned, but also in terms of societal costs and should therefore be prevented.

As the world becomes more interconnected than ever before, young people the world over are requesting credible and accessible information on sexuality and reproductive health. They want to have their many questions and concerns about sexuality addressed. They need information not only about physiology and a better understanding of the norms that society has set for sexual behaviour, but they also need to acquire the skills necessary to develop healthy relationships and engage in responsible decision-making about sex, especially during adolescence when their emotional development accelerates.

In order to respond to the needs of adolescents and young people for information and training in behavioural skills, a growing international movement has been supporting the right of adolescents to receive accurate and balanced information about sexuality and about how to develop healthy relationships and make decisions for themselves. This movement bases its actions on internationally recognized human rights standards according to which adolescents have the right to have access to information essential for their health and development (United Nations Committee on Economic, Social and Cultural Rights, 2000; United Nations Committee on the Rights of the Child, 2003). The existence of these standards implies that Governments have the responsibility of developing programmes that provide both adolescent girls and boys, whether in or out of school, accurate and appropriate information to enable them to maintain their sexual and reproductive health. Accordingly, a growing number of reproductive health professionals, schools, clinics and non-governmental organizations have developed and implemented a

wide variety of programmes aimed at providing sex education and at preventing sexually transmitted infections, including HIV/AIDS.

Typically, those programmes strive to delay the initiation of sex, reduce the number of sexual encounters and sexual partners, and increase the use of condoms and of effective contraceptive methods among young people. Sometimes, such programmes also have the goal of promoting testing for sexually transmitted infections or reducing sexual violence.

Some of those programmes are based on a written curriculum and are implemented by addressing groups of young people. Such programmes are particularly suitable for the school environment, where it is easier to reach large numbers of young people at early stages of their development and before they become sexually active. By reaching adolescents early in puberty, school settings can provide young people with the information and skills they will need to make responsible decisions about their future sexual lives. Through those programmes, educators have the opportunity of encouraging adolescents to delay the onset of sexual activity and of training them to behave responsibly when they eventually engage in sexual activity, particularly by using condoms and other modern methods of contraception. Moreover, by training teachers to impart the decision-making skills that young people need to rely on, teachers can become not only trusted sources of information but also agents of change. In most countries, schools provide the best venue to reach large numbers of young people with different socio-economic backgrounds via structured programmes that are replicable and can become sustainable.

In countries where large numbers of young people are not enrolled in secondary school, sex education programmes and those aimed at reducing the incidence of sexually transmitted infections can also be implemented in clinics and community settings that attract young people. Clinics tend to attract young people that are at higher risk of contracting a sexually transmitted infection or becoming pregnant. Young people visiting clinics are typically more aware of the risk of becoming infected and may be more ready to benefit from sound information, advice and behavioural training in decision-making skills.

This paper summarizes and updates the results of a review of the impact and effectiveness of 97 sex education programmes or programmes to reduce the incidence of sexually transmitted infections that was conducted by UNESCO in 2008-2009 (UNESCO, 2009). The next section presents the criteria used in selecting the programmes included in this review.

A. Criteria for selecting the programmes reviewed

The selection criteria for the studies whose results are reported in this paper are listed below. To be included in the review, studies had to be completed or published in 1990 or later, and, in an effort to be as inclusive as possible, studies were not required to have been published in peer-reviewed journals. The full list of documents that served as sources for this review is presented in the bibliography included at the end of this paper. The studies selected for review had to meet the following criteria:

1. The studies should refer to sex education programmes or to programmes for the prevention of sexually transmitted infections and had to:

- be based on a pre-established curriculum and implemented in a group setting (that is, interventions involving one-to-one interactions or awareness campaigns of a general nature were not included);
- have the objective of changing sexual behaviour (that is, comprehensive health education programmes aimed at changing other types of risk behaviours, such as the use of tobacco, alcohol or drugs or the practice of sex-related violence were not included);
- encourage the use of a variety of methods for the prevention of unintended pregnancy and sexually transmitted infections (that is, programmes that promoted only abstinence were excluded), and
- focus on adolescents and young people under 25 years of age in countries other than the United States of America and under 19 years of age in the United States.

2. The research methodology used to assess a programme had to:

- include a reasonably strong experimental or quasi-experimental design with well-matched intervention- and comparison-groups and with data collection occurring both before the intervention and after;
- have a sample size of at least 100;
- measure the impact of the programme on the basis of one or more of the following outcomes: delay in the initiation of sex; reduction in the frequency of intercourse; reduction of the number of sexual partners; increased use of contraception or, in particular, of condoms; reduction of pregnancy rates and adolescent birth rates; reduction of incidence of sexually transmitted infections; or changes in some other measure of sexual risk, such as the frequency of unprotected sexual intercourse, and
- measure the impact of programmes over a period of at least three months on those behaviours that can change quickly, such as the frequency of intercourse, the number of sexual partners, the use of condoms, the use of contraception, or the incidence of sexual risk-taking, or
- measure over a period of at least six months the impact of programmes on behaviours or outcomes that take longer to occur, such as changes in the timing of the initiation of sex, changes in pregnancy rates or in the incidence of sexually transmitted infections.

A brief discussion of the impact of the programmes identified on each relevant aspect of sexual behaviour is presented below.

B. IMPACT ON SEXUAL BEHAVIOUR

Among the 97 studies identified, 73 assessed the impact of sex education programmes on the timing of the initiation of sexual intercourse among young people (table 1). In total, 34 per cent of those 73 programmes delayed the initiation of sexual

intercourse among either the entire sample of young persons covered by the programme or among an important sub-group of those covered. The rest of the programmes, representing 66 per cent of the 73 programmes reviewed, had no impact on the timing of the initiation of sexual intercourse. Notably, none of the programmes considered hastened the initiation of sexual intercourse.

Among the 73 studies focusing on the timing of the initiation of sexual intercourse, 40 referred to the United States and in that country 40 per cent of the studies undertaken reported that the sex education programmes they referred to had delayed the initiation of intercourse (table 1). In developing countries, where 24 studies had assessed the impact of sex education programmes on the initiation of sexual intercourse, 29 per cent reported that the programme they focused on had delayed that initiation among young people.

A smaller number of studies assessed the impact of sex education programmes on the frequency of sexual intercourse (38 studies in total). Among them, 12 studies (32 per cent) evaluated programmes that had produced a reduction in the frequency of sexual intercourse among young people. A reduction in frequency included the cases of young people who had reverted to abstinence. The rest of the studies included 25 (66 per cent) which had had no impact on the frequency of intercourse and one (3 per cent) in which that frequency had increased (that study referred to a programme implemented in a developed country other than the United States). In both the United States and in developing countries, the sex education programmes reviewed did not increase the frequency of sexual intercourse, and in developing countries, 4 out of the 9 programmes reviewed reduced that frequency.

Regarding the number of sexual partners, 41 studies assessed the impact of sex education programmes on that number. Among them, 16 studies (39 per cent) showed that the programmes involved resulted in a reduction in the number of sexual partners young people had, whereas 25 studies (61 per cent) had no impact in that regard and none led to an increase in the number of sexual partners. Although the number of studies focusing on the effect of sex education programmes on the number of sexual partners was higher for the United States than for developing countries, the percentage of studies showing a reduction in the number of sexual partners was almost the same in developing countries as in the United States.

Taken together, the studies reviewed provide solid evidence that sex education programmes that not only emphasize the avoidance of sexual intercourse among young people but also discuss the use of condoms and other modern contraceptives to prevent pregnancy and the spread of sexually transmitted infections do not increase sexual behaviour among adolescents and young people. On the contrary, a third of the programmes reviewed delayed the initiation of sexual intercourse and, among those programmes that evaluated their impact on the frequency of sexual intercourse or on the number of sexual partners, a third resulted in a reduction of the frequency of sexual intercourse and nearly 40 per cent resulted in a decrease in the number of sexual partners. The sole study that reported an increase in the frequency of sexual intercourse is likely to be a false positive attributable to chance given the large number of tests of significance that were examined. By the same principle, a few of the results showing a reduction of risky behaviours may be the result of chance.

TABLE 1. THE NUMBER OF SEXUALITY EDUCATION PROGRAMMES DEMONSTRATING EFFECTS ON SEXUAL BEHAVIOURS

	Developing countries (N=30)	United States (N=55)	Other developed countries (N=12)	Total number of countries (N=97)	Percentage
Initiation of sex					
Delayed initiation	7	16	2	25	34
Had no significant impact	17	24	7	48	66
Hastened initiation	0	0	0	0	0
Frequency of sex					
Decreased frequency	4	8	0	12	32
Had no significant impact	5	19	1	25	66
Increased frequency	0	0	1	1	3
Number of sexual partners					
Decreased number	5	11	0	16	39
Had no significant impact	8	17	0	25	61
Increased number	0	0	0	0	0
Use of condoms					
Increased use	8	14	3	25	38
Had no significant impact	15	22	4	41	62
Decreased use	0	0	0	0	0
Use of contraception					
Increased use	2	4	1	7	35
Had no significant impact	3	8	1	12	60
Decreased use	0	1	0	1	5
Sexual risk-taking					
Reduced risk-taking	3	15	0	18	51
Had no significant impact	3	12	1	16	46
Increased risk-taking	1	0	0	1	3

C. IMPACT ON THE USE OF CONDOMS AND CONTRACEPTION

Among the 66 studies that measured the impact of sex education programmes on condom use, 25 (38 per cent) found that the programmes they evaluated increased condom use, while 41 (62 per cent) concluded that the programmes evaluated had had no impact in changing condom use. In no case did the studies available indicate that sex education programmes reduced the level of condom use. Among the 36 studies referring to the United States, the proportion of programmes that increased condom use was also 38 per cent. The number of programmes in developing countries that were the object of evaluation was smaller (23) and a similar proportion increased condom use (35 per cent). Among the seven programmes in developed countries other than the United States, three (43 per cent) increased condom use.

The number of studies that measured whether sex education programmes increased the use of other modern methods of contraception was smaller (only 20 studies did so). Among them, seven (35 per cent) increased contraceptive use; 12 (60 per cent) had no impact, and one (5 per cent) reduced contraceptive use.

Some studies used composite measures of sexual activity in combination with indicators of contraceptive use. For instance, some studies measured the frequency of intercourse without using condoms or the number of sexual partners with whom condoms were not always used in order to assess “sexual risk-taking”. Among the 35 studies with data on composite measures of sexual risk-taking, 51 per cent found that sex education

programmes decreased sexual risk-taking; 46 per cent found no impact and 3 per cent (representing one programme) found an increase in sexual risk-taking. The distribution of the studies with larger samples and the most rigorous methodology is very close to that of all studies reviewed.

D. Impact on one or more sexual behaviours

The results presented above have examined the impact of programmes on each behaviour separately. However, those results understate the overall impact of programmes because a programme may affect one or more behaviours, but not all measured behaviours simultaneously. When the effect of programmes on one or more behaviours is considered, 62 of the 97 studies available influenced at least one behaviour in a positive way either for the entire sample in the programme or for a relevant sub-group. In addition, 28 per cent of the 97 programmes improved at least two behaviours among young people.

E. Impact on the reduction of pregnancy rates and on the incidence of sexually transmitted infections

Because sexually transmitted infections and pregnancies occur less frequently than sexual activity, condom use or contraceptive use, determining whether sex education programmes have an impact on reducing the incidence of sexually transmitted infections or on pregnancy requires considerably larger samples. Most of the studies reviewed do not present adequate statistics in that regard. Among the 18 studies that used biomarkers to measure the impact of sex education programmes on the incidence of pregnancy or sexually transmitted infections, five showed significant reductions while 13 did not.

The studies reviewed revealed that even effective sex education programmes reduced risky sexual behaviour only moderately. The most effective programmes tended to reduce risky sexual behaviour by one-fourth to one-third. Thus, if 30 per cent of the young people in the control group had unprotected sex during a given period, a successful programme might reduce the prevalence of that behaviour to 20 per cent among the group of young people participating in the programme. The overall reduction in risky behaviour amounted therefore to 10 percentage points or one third with respect to the prevalence of risky behaviour in the control group. A meta-analyses of studies carried out in the United States shows that behavioural change of this magnitude can lead to significant reductions in pregnancy rates and in the incidence of sexually transmitted infections.

F. Impact on cognitive factors

Nearly all sexual education programmes that have been studied increased knowledge about different aspects of sexuality, risks of getting pregnant, HIV and other STIs. Programmes that were designed to reduce risks associated with sex and employed a logic model also relied on other factors affecting sexual behaviour. Programmes that were effective at either delaying or reducing sexual activity or increasing condom or contraceptive use typically focused on:

- Imparting knowledge about the risks associated with sexual activity, including pregnancy and the risk of acquiring a sexually transmitted infection, including HIV;
- Imparting information about methods to reduce or prevent such risks;
- Discussing personal values about sexual activity and abstinence;
- Examining attitudes regarding the use of condoms and contraception;
- Addressing perceptions of peer norms about sexual activity, condom use and the use of contraception;
- Increasing skills and self-efficacy to refuse sexual intercourse and to use condoms;
- Following through with intentions to abstain from sexual intercourse or to restrict sexual activity or the number of partners, or to use condoms, and
- Encouraging better communication with parents or other adults as well as with sexual partners.

Some studies showed that particular programmes were effective in improving these factors listed (Kirby, Obasi and Laris, 2006; Kirby, 2007). In addition, other studies have demonstrated that these factors, in turn, have an impact on adolescent sexual decision-making (Blum and Mmari, 2006; Kirby and Lepore, 2007). Thus, there is considerable evidence that effective programmes actually changed behaviour by having an impact on these factors, which then positively affected young people's sexual behaviour.

G. BEHAVIOURAL IMPACT IN DIFFERENT LOCATIONS AND REPLICATIONS

Overall, sex education programmes that discuss both the benefits of abstinence and the need to use condoms and contraception to prevent the risks associated with sexual intercourse among adolescents and young people have been effective in changing their behaviour when implemented in school, clinic or community settings and when they involve different groups of young people (that is, males and females; sexually inexperienced and sexually experienced adolescents and youth, and young people at lower and higher risk in disadvantaged and better-off communities).

It bears noting that the sex education programmes that had measurable impacts in reducing risky sexual behaviour include those implemented in countries as diverse as Chile, China, Kenya, Mexico, the United Kingdom and the United States. Thus, their effectiveness is not limited to any particular region or culture.

Furthermore, results from several replication studies in the United States have shown that when programmes found to be effective at changing the sexual behaviour of adolescents and young people are replicated in similar settings, either by the same or different researchers, they produce consistent results (Kirby, 2007). Studies have also shown that programmes demonstrated to be effective were less likely to remain so when their duration was shortened, when activities that focused on increasing condom use were dropped from them, or when they were implemented in classrooms after being designed for and evaluated in community settings.

H. Strengths and limitations of studies on the impact of sex education programmes

The studies reviewed in this paper provide strong evidence that sex education programmes can be effective at reducing risky sexual behaviour among adolescents and young people. This conclusion is warranted because all the 97 studies reviewed were based on experimental or quasi-experimental designs and more than half of them involved randomized controlled trials (the gold standard in experimental design). In addition, when the same programme was evaluated multiple times, the results obtained were generally consistent. Lastly, the programmes that were effective at changing sexual behaviour often shared common characteristics (see next section).

However, the studies reviewed had a number of limitations. Relatively few of them were conducted in developing countries and some studies lacked an adequate description of the programme being assessed. Some studies had only barely adequate evaluation designs and many were based on small samples. Most did not adjust their results to take account of the effects of chance on multiple tests of significance. Few studies measured the impact of programmes on either pregnancy rates or the incidence of sexually transmitted infections, both of which require long periods of observation. Fewer still used biological markers to measure the incidence of sexually transmitted infections or pregnancy. There was a dearth of studies focusing on long-term results and no study examined the impact of sex education programmes at population-level.

The last caveat is that the studies reviewed may constitute a biased sample because researchers may be more likely to publish reports that support their hypotheses or journals may be more likely to accept for publication studies that show that interventions have an effect and less likely to publish those showing that interventions are ineffectual. In preparing this review, it was not possible to assess whether this is indeed the case.

I. Characteristics of effective programmes

This review has provided evidence that some sex education programmes have been effective in changing the sexual behaviour of adolescents and young people in ways that protect them from the risks of pregnancy and from being infected by a sexually transmitted agent. In order to understand what makes a programme successful, Kirby, Laris and Rolleri (2006) have carried out a detailed analysis of the different elements in the development, content and implementation of effective programmes in an effort to capture the features that make them successful. They have concluded that the large majority of effective sex education programmes include a core set of characteristics that are not always part of programmes that had only a limited impact on sexual behaviour. The characteristics of effective sex education programmes are summarized below.

During the development of the curriculum, the development team should:

1. Involve experts in research on human sexuality, behaviour change and related pedagogical theory.
2. Consult with young people.
3. Assess young people’s reproductive health needs, their behaviours, their beliefs and perceptions of risk, their attitudes and skills, and their intentions regarding sexual behaviour, condoms and contraception and

4. Use a logic model approach that specifies the reproductive health goals the programme wants to achieve, the specific sexual behaviours that would lead to those goals, the cognitive risk and protective factors affecting those behaviours, and activities involved in changing those cognitive factors.
5. Design activities that are sensitive to community values and consistent with available resources including staff time, staff skills, the space available for group activities and access to supplies.
6. Test the programme using a pilot programme and obtain on-going feedback from the learners about whether and how the programme meets their needs.

The curriculum itself should:

7. Focus on clear reproductive health goals in determining the curriculum content, approach and activities. These goals should include the prevention of unintended pregnancy and sexually transmitted infection, including HIV.
8. Focus on specific sexual risk behaviours and protective behaviours leading directly to those health goals.
9. Address specific situations that might lead to unwanted or unprotected sexual intercourse and develop skills to avoid them and to get out of them if they occur.
10. Give clear information and messages about behaviours to reduce risk of sexually transmitted infections or pregnancy.
11. Focus on specific cognitive factors that affect the risk of engaging in particular sexual behaviours and that are amenable to change by the programme including, for example, knowledge about human sexuality, pregnancy and sexually transmitted infections; accurate perceptions of risk for pregnancy and sexually transmitted infections if engaging in different sexual behaviours; values about having sex or having sex with multiple partners and about using condoms or contraception; attitudes about using condoms and contraception; perception of peer norms about sex and use of protection against pregnancy and sexually transmitted infections; skills to avoid sex, to insist on using condoms or contraceptives, and to actually use condoms and contraceptives correctly; and intentions to avoid sexual risk behaviour.
12. Employ participatory teaching methods that actively involve students and help them integrate, internalize and act on the information that they are getting. Ensure that the methods are validated by pedagogy and behaviour-change science.
13. Implement multiple, educationally sound activities designed to change each of the targeted cognitive factors.
14. Provide scientifically accurate information about the risks of having unprotected sexual intercourse and the effectiveness of different methods of protection.
15. Address individual perceptions of risk and individual susceptibility to unwanted outcomes.

16. Address personal values and perceptions of family and peer norms about engaging in sexual activity or having multiple partners.
17. Address individual attitudes and peer norms toward the use of condoms and contraception and combat barriers to their use.
18. Address skills to avoid unwanted sex and to use protection correctly during intercourse, and increase self-efficacy in the use of those skills.
19. Create a safe social environment for youth to participate in.
20. Cover topics in a logical sequence.

During the implementation phase, effective programmes should:

21. Ensure that the educators selected to implement the curriculum can relate to adolescents and young people and are knowledgeable and comfortable with the material they have to present.
22. Provide training to the educators.
23. Provide on-going support, supervision and oversight from the appropriate authorities.
24. When implemented in schools, programmes should include at least 12 sessions.
25. When implemented in other than school or clinic settings, programmes should use appropriate incentives and integrated activities to recruit and retain participants.
26. Implement virtually all the activities included in the curriculum with reasonable fidelity.

J. CONCLUSIONS

This review of studies evaluating the impact of sex education programmes supports the following conclusions about the impact of those programmes on the sexual behaviour of young people.

- Sex education programmes and those aimed at reducing the incidence of sexually transmitted infections, including HIV/AIDS, that are based on a set curriculum and implemented in schools or communities can delay the onset of sexual activity among adolescents and young people, reduce the frequency of intercourse, reduce the frequency of unprotected sex, reduce the number of sexual partners, and increase condom use and contraceptive use.
- Sex education programmes do not increase sexual activity among adolescents and young people but they are not always effective at reducing it or in promoting safer sexual behaviour.
- Sex education programmes generally result in increased knowledge about human sexuality.
- To be effective, sex education programmes need to be comprehensive, provide unbiased and scientifically based information; emphasize risks of unprotected sex; explain the various practices and methods that can reduce the risks of pregnancy and of acquiring a sexually transmitted infection during intercourse; discuss values about sex and condoms and other contraceptives; address attitudes to using condoms and other

- Sex education programmes can be an important component of comprehensive strategies to reduce the incidence of unintended pregnancies and sexually transmitted infections, including HIV.
- Although the studies reviewed in this paper indicate that even the effective sex education programmes have a modest effect in changing behaviour, the impact of such effect at the population level could be significant if the programmes were to be scaled up.
- Because of the societal costs involved in addressing the consequences of risky sexual behaviour among adolescents and young people, effective sex education programmes can be a cost-effective method for changing those behaviours and avoiding their detrimental consequences.

In many countries premarital sex is common among adolescents and young people. Such behaviour is associated with high risks of unintended pregnancies, which are detrimental to the lives of adolescents and, in particular, to the girls and young women who become pregnant and are often forced to change their life courses because of those early pregnancies. Premarital or extra-marital sexual intercourse also exposes adolescents and young people to elevated risks of becoming infected with HIV or other sexually transmitted infections, with potentially catastrophic consequences for their health and wellbeing. Because HIV/AIDS is incurable and the costs of treatment are high, preventing infection is urgent. Effective prevention requires behavioural change. Effective sex education programmes that take account of the latest findings of pedagogical and behavioural-change research provide an important tool for producing that behaviour change. This review has shown that, in order to be effective, sex education programmes have to meet a number of characteristics and need to be implemented by trained educators who are knowledgeable about human sexuality, understand behavioural training and are comfortable in interacting with adolescents and young people on sensitive topics. Because few programmes currently being implemented have all the characteristics described in the previous section, their impact at the population level is still minor. It is urgent, however, that the lessons learned so far about how to develop and implement effective sex education programmes be used to guide efforts to scale up those programmes, particularly in countries where adolescents and young people are at high risk of becoming pregnant too early in life or of contracting a sexually transmitted infection.

In order to scale up effective sex education programmes, strong national and international leadership are required. Programmes with demonstrated effectiveness should be replicated in similar cultural environments, adapted to other cultures or re-designed if necessary, taking account the lessons learned and incorporating key characteristics of programmes with proven effectiveness. Rigorous evaluation and research are important to assure the effectiveness of the programmes developed.

To achieve all that, national and local authorities must support the development and implementation of sex education programmes. In countries where engaging in premarital sex is considered immoral, talking about sex is taboo and teaching about sexuality in the classroom is highly controversial, leadership from policy-makers and opinion shapers is

necessary to change minds and garner support for sex education in the classroom. It is also important to engage all key stakeholders in raising awareness about the opportunities lost and the risks arising from a failure to provide adolescents and young people with the information and behavioural skills that they need in order to avoid risky sexual behaviours. The support of stakeholders will be crucial in launching and scaling up sex education programmes. Ministries of education may take the lead in encouraging or mandating sexuality education, developing and disseminating effective curricula and providing training for educators. They can also assist in garnering grassroots' support by disseminating information on what effective programmes can achieve and the risks involved in doing nothing.

As the world is confronted with the largest generation ever of adolescents and young people, there is no time to lose in investing in their future by providing them with the information and skills needed to ensure their sexual and reproductive health over a lifetime. Careful studies have already provided a road map on how to proceed; we just need the courage and foresight to actually embark on the journey.

REFERENCES

Blum, R. and R. Mmari (2006). *Risk and Protective Factors Affecting Adolescent Reproductive Health in Developing Countries: an Analysis of Adolescent Sexual and Reproductive Health Literature from around the World.* Geneva: World Health Organization.

Kirby D. (2007). *Emerging Answers 2007: Research Findings on Programmes to Reduce Teen Pregnancy and Sexually Transmitted Diseases*, Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy.

Kirby D. and G. Lepore (2007). *Sexual risk and Protective Factors: Factors Affecting Teen Sexual Behaviour, Pregnancy, Childbearing and Sexually Transmitted Disease: Which Are Important? Which Can You Change? Update.* Washington DC: National Campaign to Prevent Teen Pregnancy.

Kirby D., B. A. Laris and L. Rolleri (2006). *Sex and HIV Education Programmes for Youth: Their Impact and Important Characteristics.* Scotts Valley, California: ETR Associates.

Kirby, D., A. Obasi and B. Laris (2006). *The Effectiveness of Sex Education and HIV Interventions in Schools in Developing Countries, Preventing HIV/AIDS in Young People: A Systemic Review of the Evidence from Developing Countries.* Geneva: World Health Organization.

UNESCO (2009). *International Technical Guidance on Sexuality Education: An Evidence-informed Approach for Schools, Teachers and Health Educators*, Volume 1: The rationale for sexuality education, Paris: UNESCO.

United Nations Committee on Economic, Social and Cultural Rights (2000). Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights. General Comment No. 14 (2000). Twenty-second session, 25 April to 12 May 2000, E/C.12/2000/4, para.11.

United Nations Committee on the Rights of the Child (2003). General Comment No. 4 (2003). Thirty-third session, 19 May to 6 June 2003, CRC/GC/2003/4, para. 26.

BIBLIOGRAPHY OF STUDIES REVIEWED IN THIS PAPER

Aarons, S. J. and others (2000). Postponing sexual intercourse among urban junior high school students: A randomized controlled evaluation. *Journal of Adolescent Health*, vol. 27, No. 4, pp. 236-247.

Agha, S. and R. Van Rossem (2004). Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behaviour of Zambian adolescents. *Journal of Adolescent Health*, vol. 34, No. 5, pp. 441-452.

Antunes, M. and others (1997). Evaluating an AIDS sexual risk reduction programme for young adults in public night schools in Sào Paulo, Brazil. *AIDS*, vol. 11 (Supplement 1), pp. S121-S127.

Baker, S. and others (2003). *Evaluation of an HIV/AIDS Programme for College Students in Thailand.* Washington, D.C.: Population Council.

Blake, S. M. and others (2000). *Overall and Differential Impact of an HIV/STD Prevention Curriculum for Adolescents*. Washington, DC: Academy for Educational Development.

Borawski, E. and others (2009). *Taking "Be Proud! Be Responsible!" to the suburbs: A replication study.* Cleveland: Case Western Reserve University School of Medicine.

Boyer, C. and others (2005). Evaluation of a cognitive-behavioural, group, randomized controlled intervention trial to prevent sexually transmitted infections and unintended pregnancies in young women. *Preventive Medicine,* vol. 40, pp. 420-431.

Boyer, C., M. Shafer and J. Tschann (1997). Evaluation of a knowledge - and cognitive - behavioural skillsbuilding intervention to prevent STDs and HIV infection in high school students. *Adolescence,* vol. 32 , No. 125, pp. 25-42.

Cabezon, C. and others (2005). Adolescent pregnancy prevention: An abstinence-centered randomized controlled intervention in a Chilean public high school. *Journal of Adolescent Health*, vol. 36, No. 1, pp. 64- 69.

Caron, F. and others (2004). Evaluation of a theoretically based AIDS/STD peer education programme on postponing sexual intercourse and on condom use among adolescents attending high school. *Health Education Research*, vol. 19, No. 2, pp. 185-197.

Cowan, F. M. and others (2008). The Regai Dzive Shiri Project: A cluster randomised controlled trial to determine the effectiveness of a multi-component community-based HIV prevention intervention for rural youth in Zimbabwe – study design and baseline results. *Tropical Medicine and International Health*, vol. 13, No. 10, pp. 1235-1244.

Coyle, K. and others (2004). Draw the Line/Respect the Line: A randomized trial of a middle school intervention to reduce sexual risk behaviours. *American Journal of Public Health*, vol. 94, No. 5, pp. 843-851.

Coyle, K. K. and others (2001). Safer Choices: Reducing Teen Pregnancy, HIV and STDs. *Public Health Reports*, vol. 1, No. 16, pp. 82- 93.

Coyle, K. K. and others (2006). All4You! A randomized trial of an HIV, other STDs and pregnancy prevention intervention for alternative school students. *AIDS Education and Prevention*, vol. 18, No. 3, pp. 187-203.

DiClemente, R. J. and others (2004). Efficacy of an HIV prevention intervention for African American adolescent girls: A randomized controlled trial. *Journal of the American Medical Association,* vol. 292, No. 2, pp. 171-179.

Diez, E. and others (2000). Effects on attitudes, knowledge, intentions and behaviour of an AIDS prevention programme targeting secondary school adolescents. *Promotion and Education*, vol. 7, No. 3, pp. 17-22.

Duflo, E. and others (2006). Education and HIV/AIDS prevention: Evidence from a randomized evaluation in Western Kenya. Boston: Department of Economics and Poverty Action Lab.

Dupas, P. (2006). Relative risks and the market for sex: Teenagers, sugar daddies and HIV in Kenya. Hanover: Dartmouth College.

Eggleston, E. and others (2000). Evaluation of a sexuality education programme for young adolescents in Jamaica. Revista Panamericana de Salud Pública/Pan American *Journal of Public Health,* vol. 7, No. 2, pp. 102-112.

Eisen, M., G. L. Zellman and A. L. McAlister (1990). Evaluating the impact of a theory-based sexuality and contraceptive education programme. *Family Planning Perspectives,* vol. 22, No. 6, pp. 261-271.

Ekstrand, M. L. and others (1996). Peerled AIDS prevention delays onset of sexual activity and changes peer norms among urban junior high school students, paper presented at the XI International Conference on AIDS held in Vancouver, Canada.

Erulkar, A. and others (2004). Behaviour change evaluation of a culturally consistent reproductive health programme for young Kenyans. *International Family Planning Perspectives*, vol. 30, No. 2, pp. 58-67

Fawole, I. and others (1999). A school-based AIDS education programme for secondary school students in Nigeria: A review of effectiveness. *Health Education Research*, vol. 14, No. 5, pp. 675-683.

Fisher, J. and others (2002). Information-motivation-behavioural skills modelbased HIV risk behaviour change intervention for inner-city high school youth. *Health Psychology*, vol. 21, No. 2, pp. 177-186. .

Fitzgerald, A. and others (1999). Use of western based HIV risk-reduction interventions targeting adolescents in an African setting. *Journal of Adolescent Health*, vol. 23, No. 1, pp. 52-61.

Gillmore, M. R. and others (1997). Effects of a skill-based intervention to encourage condom use among high-risk heterosexually active adolescents. *AIDS Prevention and Education*, vol. 9 (Suppl A), pp. 22-43.

Goldberg, E. and others (2009). A human immunodeficiency virus risk reduction intervention for incarcerated youth: A randomized controlled trial. *Journal of Adolescent Health*, vol. 44, pp. 136-145.

Gottsegen, E. and W. W. Philliber (2001). Impact of a sexual responsibility programme on young males. *Adolescence*, vol. 36, No. 143, pp. 427-433.

Henderson, M. and others (2007). Impact of a theoretically based sex education programme (SHARE) delivered by teachers on NHS registered conceptions and terminations: Final results of cluster randomized trial. *British Medical Journal*, vol. 334, No. 7585, p. 133.

Howard, M. and J. McCabe (1990). Helping teenagers postpone sexual involvement. *Family Planning Perspectives*, vol. 22, No. 1, pp. 21-26.

Hubbard, B. M., M. L. Giese and J. Rainey (1998). A replication of Reducing the Risk, a theory-based sexuality curriculum for adolescents. *Journal of School Health*, vol. 68, No. 6, pp. 243-247.

James, S. and others (2006). The impact of an HIV and AIDS life skills programme on secondary school students in KwaZulu-Natal, South Africa. *AIDS Education and Prevention*, vol. 18, No. 4, pp. 281-294.

Jemmott, J., III. (2005). Effectiveness of an HIV/ STD risk- reduction intervention implemented by nongovernmental organizations: A randomized controlled trial among adolescents, paper presented at the American Psychological Association Annual Conference held in Washington, DC.

Jemmott, J., III, L. Jemmott and G. Fong (1992). Reductions in HIV risk-associated sexual behaviours among black male adolescents: Effects of an AIDS prevention intervention. *American Journal of Public Health*, vol. 82, No. 3, pp. 372-377.

Jemmott, J., III, L. Jemmott and G. Fong (1998). Abstinence and safer sex HIV risk-reduction interventions for African-American adolescents: A randomized controlled trial. *Journal of the American Medical Association*, vol. 279, No. 19, pp. 1529-1536.

Jemmott, J., III and others (1999). Reducing HIV risk-associated sexual behaviours among African American adolescents: Testing the generality of intervention effects. *American Journal of Community Psychology*, vol. 27, No. 2, pp. 161-187.

Jemmott, J. B., III. (2006). Efficacy of an abstinence only intervention over 24-months: A randomized controlled trial with young adolescents, paper presented at the XVI International AIDS Conference held in Toronto, Canada.

Jewkes, R. and others (2008). Impact of Stepping Stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomized controlled trial. *British Medical Journal*, vol. 337, p. A506.

Jewkes, R. and others. (2007). Evaluation of Stepping Stones: A gender transformative HIV prevention intervention. Witwatersrand: South African Medical Research Council.

Karnell, A. P. and others (2006). Efficacy of an American alcohol and HIV prevention curriculum adapted for use in South Africa: Results of a pilot study in five township schools. *AIDS Education and Prevention*, vol. 18, No. 4, pp. 295-310.

Kinsler, J. and others (2004). Evaluation of a school-based intervention for HIV/ AIDS prevention among Belizean adolescents. *Health Education Research,* vol. 19, No. 6, pp. 730-738.

Kirby, D. and others (1991). Reducing the Risk: Impact of a new curriculum on sexual risk-taking. *Family Planning Perspectives*, vol. 23, No. 6, pp. 253-263.

Kirby, D. and others (2004). The «Safer Choices» intervention: Its impact on the sexual behaviours of different subgroups of high school students. *Journal of Adolescent Health*, vol. 35, No. 6, pp. 442-452.

Kirby, D. and others (1997). An impact evaluation of Project SNAPP: 43 An AIDS and pregnancy prevention middle school programme. *AIDS Education and Prevention*, vol. 9 (Suppl A), pp. 44-61.

Klepp, K. and others (1997). AIDS education in Tanzania: Promoting risk reduction among primary school children. *Journal of Public Health*, vol. 87, No. 12, pp. 1931- 1936.

Klepp, K. and others (1994). AIDS education for primary school children in Tanzania: An evaluation study. *AIDS*, vol. 8, No. 8, pp. 1157-1162.

Koniak-Griffin, D. and others (2003). Project CHARM: An HIV prevention programme for adolescent mothers. *Family and Community Health*, vol. 26, No. 2, pp. 94-107.

Kvalem, I. and others (1996). The effect of sex education on adolescents' use of condoms: Applying the Solomon four-group design. *Health Education Quarterly*, vol. 23, No. 1, pp. 34-47.

LaChausse, R. (2006). Evaluation of the Positive Prevention HIV/STD Curriculum for Students Grades 9-12. *American Journal of Health Education*, vol. 37, No. 4, pp. 203-209.

Levy, S. R. and others (1995). Impact of a schoolbased AIDS prevention programme on risk and protective behaviour for newly sexually active students. *Journal of School Health*, vol. 65, No. 4, pp. 145- 151.

Lieberman, L. D. and others (2000). Long-term outcomes of an abstinence-based, small-group pregnancy prevention programme in New York City schools. *Family Planning Perspectives*, vol. 32, No. 5, pp. 237-245.

Little, C. B. and A. Rankin (n.d.). An evaluation of the Postponing Sexual Involvement curriculum among upstate New York eighth graders. Cortland: State University of New York. Mimeo.

Magura, S., S. Kang and J. L. Shapiro (1994). Outcomes of intensive AIDS education for male adolescent drug users in jail. *Journal of Adolescent Health*, vol. 15, No. 6, pp. 457-463.

Main, D. S. and others (1994). Preventing HIV infection among adolescents: Evaluation of a school-based education programme. *Preventive Medicine*, vol. 23, No, 4, pp. 409-417.

Martinez-Donate, A. and others (2004). Evaluation of two school-based HIV prevention interventions in the border city of Tijuana, Mexico. *The Journal of Sex Research*, vol. 41, No. 3, pp. 267-278.

Maticka-Tyndale, E. and others (2004). Primary School Action for Better Health: 12-18 Month Evaluation—Final Report on PSABH Evaluation in Nyanza and Rift Valley. Windsor, Canada: University of Windsor.

Maticka-Tyndale, E., J. Wildish and M. Gichuru (2007). Quasi-experimental evaluation of a national primary school HIV intervention in Kenya. *Evaluation and Programme Planning*, vol. 30, pp. 172-186.

McCauley, A., Pick, S. and Givaudan, M. (2004). *Programming for HIV Prevention in Mexican Schools*. Washington, D.C.: Population Council.

Mellanby, A. and others (1995). School sex education: An experimental programme with educational and medical benefit. *British Medical Journal*, vol. 311, pp. 414-417.

MEMA kwa Vijana. (2008). Rethinking how to prevent HIV in young people: Evidence from two large randomised controlled trials in Tanzania and Zimbabwe. London: MEMA kwa Vijana Consortium.

MEMA kwa Vijana. (2008). Long-term evaluation of the MEMA kwa Vijuana adolescent sexual health programme in rural Mwanza, Tanzania: A randomised controlled trial. London: MEMA kwa Vijana Consortium.

Middlestadt, S. E. and others (n.d.) Impact of an HIV/STD prevention intervention on urban middle school students. Washington, DC: Academy of Educational Development. Mimeo.

Mitchell-DiCenso, A. and others (1997). Evaluation of an educational programme to prevent adolescent pregnancy. *Health Education and Behaviour*, vol. 24, No. 3, pp. 300-312.

Morrison, D. M. and others (2007). Replicating a teen HIV/STD preventive intervention in a multicultural city. *AIDS Education and Prevention*, vol. 19, No. 3, pp. 258-273.

Mukoma, W. K. (2006). Process and outcome evaluation of a school-based HIV/AIDS prevention intervention in Cape Town high schools. Cape Town, South Africa: University of Cape Town.

Murray, N. and others (2000). *An Evaluation of an Integrated Adolescent Development Programme for Urban Teenagers in Santiago, Chile.* Washington, D.C.: Futures Group.

Nicholson, H. J. and L. T. Postrado (1991). *Truth, Trust and Technology: New Research on Preventing Adolescent Pregnancy.* New York: Girls Incorporated.

Pulerwitz, J., G. Barker and M. Segundo (2004). *Promoting Healthy Relationships and HIV/STI Prevention for Young Men: Positive Findings from an Intervention Study in Brazil*. Washington DC: Population Council.

Reddy, P., S. James and A. McCauley (2003). *Programming for HIV Prevention in South African Schools: A report on Programme Implementation*. Washington, D.C.: Population Council.

Regai Dzive Shiri Research Team. (2008). Cluster randomised trial of a multi-component HIV prevention intervention for young people in rural Zimbabwe: Technical briefing note. Harare, Regai Dzive Shiri Research Team.

Ross, D. (2003). MEMA kwa Vijana: Randomized controlled trial of an adolescent sexual health programme in rural Mwanza, Tanzania. London: London School of Hygiene and Tropical Medicine.

Ross, D., B. Dick and J. Ferguson (2006). *Preventing HIV/AIDS in Young People: A Systematic Review of the Evidence from Developing Countries.* Geneva: WHO.

Ross, D. A. and others (2007). Biological and behavioural impact of an adolescent sexual health intervention in Tanzania: a community-randomised trial. *AIDS*, vol. 21, No. 14, pp.1943-1955.

Rotheram-Borus, M. and others (1998). Timing of HIV interventions on reductions in sexual risk among adolescents. *American Journal of Community Psychology*, vol. 26, No. 1, pp. 73-96.

Rotheram-Borus, M. and others (2003). Reductions in HIV risk among runaway youth. *Prevention Science*, vol. 4, No. 3, pp. 173-187.

Schaalma, H. and others (1996). Planned development and evaluation of AIDS/STD education for secondary school students in the Netherlands: Short-term effects. *Health Education Quarterly*, vol. 23, No. 4, pp. 469-487.

Seidman, M. and others (1995). Fertility awareness education in the schools: A pilot programme in Santiago Chile. Paper presented at the American Public Health Association Annual Meeting.

Shamagonam, J. and others (2006). The impact of an HIV and AIDS life skills programme on secondary school students in Kwazulu-Natal, South Africa. *AIDS Education and Prevention*, vol. 18, No. 4, pp. 281-294.

Siegel, D., M. Aten and M. Enaharo (2001). Longterm effects of a middle school- and high schoolbased human immunodeficiency virus sexual risk prevention intervention. *Archives of Pediatrics and Adolescent Medicine*, vol. 155, No. 10, pp. 1117-1126.

Siegel, D. and others (1995). Change in junior high school students‘ AIDS-related knowledge, misconceptions, attitudes, and HIV-prevention behaviours: Effects of a school-based intervention. *AIDS Education and Prevention*, vol. 7, No. 6, pp. 534-543.

Slonim-Nevo, V. and others (1996). The long-term impact of AIDS preventive interventions for delinquent and abused adolescents. *Adolescence*, vol. 31, No. 122, pp. 409-421.

Smith, E. A. and others (2008). Substance use and sexual risk prevention in Cape Town, South Africa: An evaluation of the HealthWise programme. *Prevention Science*, vol. 9, No. 4, pp. 311-321.

Smith, P., M. Weinman and J. Parrilli (1997). The role of condom motivation education in the reduction of new and reinfection rates of sexually transmitted diseases among inner-city female adolescents. *Patient Education and Counselling*, vol. 31, pp. 77-81.

St. Lawrence, J. and others (1999). Sexual risk reduction and anger management interventions for incarcerated male adolescents: A randomized controlled trial of two interventions. *Journal of Sex Education and Therapy*, vol. 24, pp. 9-17.

St. Lawrence, J. and others (2002). Reducing STD and HIV risk behaviour of substance-dependent adolescents: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, vol. 70, No. 4, pp. 1010-1021.

St. Lawrence, J. S. and others (1995). Cognitive-behavioural intervention to reduce African American adolescents’ risk for HIV infection. *Journal of Consulting and Clinical Psychology*, vol. 63, No. 2, pp. 221-237.

Stanton, B. and others (2005). The complex business of adapting effective interventions to new populations, An urban to rural transfer. *Journal of Adolescent Health*, vol. 37, No. 163.e, pp. 17-26.

Stanton, B. and others (1998). Increased protected sex and abstinence among Namibian youth following a HIV risk-reduction intervention: A randomized, longitudinal study. *AIDS*, vol. 12, pp. 2473-2480.

Stanton, B. and others (1996a). A randomized, controlled effectiveness trial of an AIDS prevention programme for low-income African-American youths. Archives of *Pediatrics and Adolescent Medicine*, vol. 150, pp. 363-372.

Stephenson, J. M. and others (2004). Pupil-led sex education in England (RIPPLE study): clusterrandomised intervention trial. Lancet, vol. 364, No. 9431, pp. 338-346.

Thato, R., R. Jenkins and N. Dusitsin (2008). Effects of the culturally-sensitive comprehensive sex education programme among Thai secondary school students. *Journal of Advanced Nursing*, vol. 62, No. 4, pp. 457- 469.

Tucker, J. and others (2007). The effect of the national demonstration project Healthy Respect on teenage sexual health behaviour. *European Journal of Public Health*, vol. 17, No. 1, pp. 33-41.

Villarruel, A., J. Jemmott, III and L. Jemmott (2006). A randomized controlled trial testing an HIV prevention intervention for Latino youth. *Archives of Pediatrics and Adolescent Medicine*, vol. 160, No. 8, pp. 772- 777.

Walker, D. and others (2006). HIV prevention in Mexican schools: prospective randomised evaluation of intervention. *British Medical Journal*, vol. 332, No. 7551, pp. 1189-1194.

Walter, H. J. and R. D. Vaughan (1993). AIDS risk reduction among a multi-ethnic sample of urban high school students. *Journal of the American Medical Association*, vol. 270, No. 6, pp. 725-730.

Wang, B. and others (2005). The potential of comprehensive sex education in China: findings from suburban Shanghai. *International Family Planning Perspectives*, vol. 31, No. 2, pp. 63-72.

Wang, L. Y. and others (2000). Economic evaluation of Safer Choices. *Archives of Pediatrics and Adolescent Medicine*, vol. 154, No. 10, pp. 1017-1024.

Wight, D. and others (2002). The limits of teacher-delivered sex education: Interim behavioural outcomes from a randomised trial. *British Medical Journal*, vol. 324, pp. 1430-1433.

Wilson, D., A. Mparadzi and S. Lavelle (1992). An experimental comparison of two AIDS prevention interventions among young Zimbabweans. *The Journal of Social Psychology*, vol. 132, No.3, pp. 415-417.

Zimmerman, R. and others (2008). Effects of a school-based, theory driven HIV and pregnancy prevention curriculum. *Perspectives on Sexual and Reproductive Health*, vol. 40, No. 1, pp. 42–51.