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UNIVERSITY OF THE WITWATERSRAND
FACULTY OF HEALTH SCIENCES

SEXUALLY TRANSMITTED DISEASE PREVENTION: KNOWLEDGE, ATTITUDES, AND PRACTICES AMONG SCHOOL PUPILS IN RURAL GHANA

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in partial fulfillment of the requirements for the degree of Master of Science in Medicine in the field of Population-based Field Epidemiology

- 2007 -

DECLARATION

I, Le Quyen Duong declare that this research report is my own work. It is being submitted for the degree of Master of Science in Medicine in the field of Population-based Field Epidemiology in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.



The 10th day of November, 2007

To my beloved parents

Duong Dinh Giac & Nguyen Thi Cao Van

ABSTRACT

Introduction: Sexually transmitted diseases (STDs) are serious problems for adolescents and young people. To protect adolescents from these diseases, there is a need to educate them on STD prevention by providing them with relevant information and equipping them with the life skills that will enable them to put knowledge into practice. It is recommended that STD-prevention programmes should take into account sex differences. However, limited data are available on how adolescent boys and girls differ in knowledge, attitudes, and practices regarding STD prevention in the same study setting.

Aim: To examine sex differences in knowledge, attitudes, and practices regarding STD prevention among junior secondary school pupils in the Kassena-Nankana district, Ghana.

Design: This research report is based on secondary data analysis of a cross-sectional knowledge, attitude, and practice survey of sexual and reproductive health conducted among junior secondary school pupils in the Kassena-Nankana district in 2005. The original survey had been carried out before the subject 'Adolescent sexual and reproductive health' was initiated in junior secondary schools in this district as an intervention study. Responses from 6,225 school pupils aged 10-19 years (3,011 schoolboys and 3,214 schoolgirls) were analysed using Stata™ version 9.0 software.

Results: The study found that school pupils had unsatisfactory knowledge about STDs; boys tended to be more knowledgeable than girls ($p < 0.05$). In terms of attitude towards condom use, a significantly higher percentage of boys (70%) compared with girls (61%) felt confident about insisting on condom use whenever they had sex. However, boys were more likely to be involved in sexual risk behaviours than girls. Eighteen percent of boys and 8% of girls reported being sexually experienced ($p < 0.05$). Boys started having sex earlier than girls (at 14.5 compared with 15.1 years, $p < 0.05$). Sixty-two percent of boys had sex with multiple partners compared with 32% of girls ($p < 0.05$). The mean number of lifetime sexual partners of boys and girls was 4.2 and 2.5, respectively ($p < 0.05$). The percentage of people reporting non-use of condoms during last sexual encounter was significantly higher among boys (37%) than girls (29%). Differences were observed in association of knowledge and attitudes regarding STD prevention with sexual activities among both boys and girls.

Conclusion: Results from the study show sex differences in knowledge, attitudes, and practices regarding STD prevention among school pupils. This underlines the need for specific STD-prevention education programmes for each sex. The research report gives some suggestions on how to design these programmes. It is hoped that this will contribute towards controlling the spread of these diseases in Ghana as well as other sub-Saharan African countries.

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
HSV-2	Herpes Simplex Virus 2
KAP	Knowledge, Attitude, and Practice
STD(s)	Sexually Transmitted Disease(s)
UNAIDS	Joint United Nations Programme on AIDS
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
WHO	World Health Organization

1.0 INTRODUCTION

1.1 Background

The World Health Organization (WHO) defines adolescents as people between 10 and 19 years of age. Individuals within this age range have passed through childhood but are not yet considered adults. Adolescence is an important transitional phase, during which humans experience rapid physical, mental, and social development. This stage of human development is also marked by increased experimentation, as adolescents are keen to try new things, often without thought for their consequences. This second decade of life is thus fraught with dangers, including threats to health (1, 2).

Today, adolescents are recognized as a group with special health-related vulnerabilities (3). In addition to tobacco use, suicides, and road traffic accidents, sexual and reproductive behaviour is one of the four crucial factors leading to illness, disability, and death in this age group (1). Many people have sexual intercourse for the first time in their teen years, yet numerous studies reveal that adolescents are poorly informed about and have negative attitudes towards sexually transmitted disease (STD) prevention (1, 4-11). Lack of information and negative attitudes encourage sexual risk behaviour, thus increasing individuals' chances of acquiring STDs (12). In recent years, STDs have occurred mostly among young people, with the highest reported rates found among those aged 15-24 years. Approximately 60% of new cases of human immunodeficiency virus (HIV) and half of HIV-infected people were found in this age group (3).

To protect adolescents from these diseases, there is a need to educate them on STD prevention by providing them with relevant information and equipping them with the life skills that will enable them to put knowledge into practice (1, 11, 13). STD-prevention education programmes implemented by governments and international organizations in

developing and developed countries have had positive impacts on adolescents (14). How to make these programmes meet the needs of different groups of adolescents is a challenge facing authorities and programmers.

1.2 Statement of problem

Sex is an important factor in sexual and reproductive health issues, including STDs (2, 15). Biological and social differences put boys and girls at different levels of risk of contracting STDs; hence, their needs regarding STD prevention may differ (12). Thus, it is suggested that STD-prevention programmes should take into account differences between boys and girls (5, 6, 11, 13, 16-18). Despite this recommendation, at present, limited number of STD-prevention education programmes targeted at adolescents have addressed sex differences. Why are we unable to apply the recommendation mentioned above in the development of these programmes? One reason may be that while we are aware of what needs to be done, we do not quite know how to do it.

Knowledge, attitudes, and practices regarding STD prevention among adolescents have been the focus of numerous studies. Some of these have explored sex differences influencing individual risk of acquiring STDs. However, most of these studies look at only one or two of the three mentioned factors (5-10, 16, 17, 19-23). An awareness of how adolescent boys and girls in the same study setting differ in all three factors will provide a better understanding of how sex differences need to be addressed in the fight against STDs in this age group.

1.3 Justification for the study

In addition to avoiding unwanted pregnancy, the prevention of STDs is one of two sexual and reproductive health needs of young people in Ghana (5). Effective STD-prevention

programmes are needed for Ghanaian adolescents. In the Kassena-Nankana district, a school-based education programme is being implemented as part of a broader adolescent sexual and reproductive health intervention. Little is known about sex differences; hence these have not been taken into account in designing the current intervention programme.

This study compares knowledge, attitudes, and practices regarding STD prevention among schoolboys and schoolgirls in a rural district in northern Ghana. Findings from this study could be used to improve the quality and effectiveness of the current intervention programme. In particular, sex differences observed in this study could help redesign suitable informational material and strategies in a sex-sensitive manner within the scope of the STD-prevention education programme. Furthermore, this study could provide information useful for the development of effective STD-prevention education programmes for adolescents, thereby contributing towards controlling the spread of these diseases in Ghana as well as other sub-Saharan African countries.

1.4 Literature review

1.4.1 Sexually transmitted disease prevention among adolescents

The term ‘sexually transmitted diseases’ denotes disorders that are principally spread by intimate contact (24). These diseases are not merely acute illnesses, but may lead to serious complications such as infertility, ectopic pregnancy, cervical cancer, fetal wastage, and even death (2, 13). Many STDs are curable, but they can be cured only if the patients are correctly diagnosed and treated in time (25). Furthermore, there is no known cure for some STDs such as HIV/AIDS. The prevention of STDs is therefore of the utmost importance. In addition, the risk of contracting and spreading HIV/AIDS is reduced by the prevention and cure of other STDs (11, 13, 15). Prevention through lifestyle and behavioural modification is currently recommended as the primary protection against these diseases

(24). Abstinence from sex, being faithful to one sexual partner, and correct and consistent use of condoms constitute the 'ABC' approaches to STD prevention. They are recommended as effective methods to prevent STDs among adolescents (11).

STDs are serious health problems for adolescents and young people (13). Every year 5% of adolescents in the world contract an STD (1). Some STDs such as chlamydia, human papillomavirus (HPV), gonorrhoea, and syphilis have higher prevalence and incidence among youth than others (3). Adolescents have been devastated by the HIV/AIDS pandemic. The impact of HIV/AIDS on people in Sub-Saharan African countries is more serious than in any other region of the world. This region with only 10% of the global population is where over 60% of all HIV-infected people live. In 2005, approximately 4.6% of females aged 15-24 years and 1.7% of males of the same age group in this region were HIV-infected (26). In terms of STDs other than HIV/AIDS, the 2004 national survey of adolescents between 12 and 19 years of age in Ghana showed that 3.6% of girls and 1.4% of boys reported infections (5). The real percentage of infected adolescents might be higher because of reluctance to report infection or seek diagnostic tests.

Today various sources provide adolescents with information on sexual and reproductive health issues, including STDs. These sources include family, teachers, friends, health professionals, and the mass media (3, 5, 7-10, 17, 19, 27). However, the majority of adolescents have yet to obtain sufficient accurate information on STDs (3, 11). Information about HIV/AIDS quickly gained global currency due to the rapid spread of the pandemic and widespread media coverage and public information programmes. A recent national survey in Ghana found that nearly all adolescents heard about HIV/AIDS, yet a significant percentage of adolescents could not list all transmission mechanisms of the disease. They even believed that HIV/AIDS was spread by mosquito bites,

witchcraft, and toilets. Nearly 10% of adolescents thought that HIV/AIDS could be cured by having sex with a virgin (5). Insufficient and incorrect information on HIV/AIDS persists in other African countries such as Tanzania as well (6). In a national study in South Africa, where 10% of young people aged 15-24 years were living with HIV, 1% of boys aged 15-19 years were not aware of HIV/AIDS and 9% thought that there were no preventive methods for the disease (7).

Less than 50% of Ghanaian adolescents have heard about STDs other than HIV/AIDS (5). A qualitative study conducted in Ghana and three other African countries showed that many adolescents could not list STDs other than HIV/AIDS correctly (19). Although the increased risk of acquiring and spreading HIV if infected with other STDs has been demonstrated, Nigerian adolescents seemed not to appreciate this link between HIV/AIDS and other STDs (17). An incorrect understanding of STDs other than HIV/AIDS appears in developed countries as well. A study in Canada showed that 28% of urban high school students identified HPV as a cause of HIV/AIDS (9).

Lack of knowledge causes low self-perception of risk of acquiring STDs (5). In South Africa, 62% of HIV-infected young people considered themselves at no or little risk of contracting HIV/AIDS (7). When adolescents do not know their own risk level, they tend not to feel that it is necessary for them to take preventive actions.

Adolescents engage in sexual activities in pursuit of pleasure, under peer pressure, in order to maintain love relations, and even for financial reasons (5, 17, 19, 20). Nowadays, early sexual debut tends to be linked to high risk-taking behaviours (11). Sexual contact among adolescents often occurs with multiple short-term partners, or high-risk partners combined with inconsistent, incorrect, or non-use of condoms. The 2004 national survey of adolescents

in Ghana found that only 22% of sexually experienced girls and 40% of sexually experienced boys reported only one lifetime sexual partner (5). A study in secondary schools in Nigeria found that nearly half of sexually experienced school pupils in Nigeria did not use condoms during last sexual encounter (20). A study in Brazil showed a fairy substantial proportion of adolescents having sex with multiple partners or sex workers in the absence of condom use (10). Reasons for non-use of condoms include unawareness, misconceptions, lack of skills, price and unavailability of condoms, cultural barriers, and trust (3, 5, 17, 19). Moreover, there is evidence that some STD-infected adolescents deliberately attempt to spread diseases, possibly out of a desire to take revenge (17).

Levels of individual STD risk are influenced by factors such as age at first sex, frequency and type of sexual intercourse, number and characteristics of sexual partners, and condom use (3). If they are to avoid sexual risk behaviours, adolescents must receive education on STDs. Adequate and accurate sex education programmes enable adolescents not only to protect themselves from STDs but also to motivate others to make safe choices (11, 14).

The primary goals of sex education for young people are: (i) to provide them with relevant and accurate information; (ii) to provide them with the skills to abstain from sex until they are mature; (iii) to ensure that they know how to avoid unsafe sex in order to protect themselves from STDs and pregnancy; and (iv) to enable them to achieve sexual well-being in adulthood (29). The first sex education lessons must be given to adolescents before their first sexual encounter (5, 11, 13, 15). For sex education programmes to be effective, the content and approach must take into account differences between different groups of adolescents – boys and girls, rural and urban adolescents, younger and older adolescents (5, 11).

1.4.2 Sex and gender differences in knowledge, attitudes, and practices

The term ‘sex’ refers to men/boys and women/girls in regard to the biological distinctions between the two groups. In most case, sex determines gender. The term ‘gender’ refers to men/boys and women/girls in regard to the social distinctions – thought, lifestyle, familial and socio-economic position, and duty towards society – usually made between the two groups (2). Sex also generates sex differences in knowledge, attitudes, and practices of STD prevention, which in turn influence individual risks of acquiring STDs (12). Sex must therefore be emphasized in the fight against the spread of STDs (3, 15). Sex differences may vary from area to area on the basis of culture, economics, and education. Some of the sex differences that apply among adolescents are similar to those that apply among adults, but others are only specific to adolescents.

In areas where premarital sex among girls remains a taboo, adolescent girls are reluctant to seek information related to sex. They fear that if people know they are seeking information on sexual issues, their virginity will be put into question (12). In Burkina Faso, girls did not dare to discuss sex even with their same-sex friends, except their best friends (19). Therefore, their knowledge of sexual and reproductive health is gained passively. In contrast, their male counterparts discuss sexual matters freely. This imbalance may lead to a better knowledge of STD prevention in adolescent boys than girls. In Korea, where similar sex differences in seeking information on sexual and reproductive health exist, a study conducted in high schools revealed that boys knew about HIV/AIDS more than girls (8). However, the opposite sex differences appear in areas where information on sex can be discussed openly. Urban high school girls in Canada knew about Papanicolaou testing more than their male counterparts (9). In communities with high STD prevalence in the United States, adolescent girls were more knowledgeable about the consequences of STDs for future fertility than boys (22).

In terms of attitudes towards STD prevention, sex differences are found in several studies. A study in Korea concluded that schoolgirls were more likely to have negative attitudes towards HIV-infected people than schoolboys (8). Schoolboys in the United States tended to regard sex as a proof of reaching adulthood or an expression of love rather than schoolgirls (23). Another study in the United States showed that schoolboys were more likely to intend to have sex than schoolgirls in the next year and schoolgirls felt more pressure from others to have sex than schoolboys (18).

In most studies on sexual and reproductive health among adolescents conducted in both developing and developed countries, a higher percentage of boys than girls report being sexually experienced (8, 9, 20, 22, 23). Furthermore, compared with girls, boys are more likely to report multiple sexual partners, including sex workers (7, 10, 20). In addition, they are more likely to engage in substance use, which is closely associated with increases in the practice of unsafe sex (11, 12, 21). Many South African youth were not confident about condom use during sexual intercourse under the influence of alcohol or drugs (7). Because of these factors, boys are more likely to contract and spread STDs than girls.

Adolescent girls are less likely to engage in unsafe sex than boys. A study in the United States showed that before making the decision to have sex, girls were more likely to consider the possible consequences than boys (23). However, in many areas, adolescent girls meet with numerous difficulties in taking action to protect themselves. Adolescent girls often have less decision-making powers than their sexual partners (3, 15). Even when they know about safe sexual practices, they cannot insist on them without their sexual partners' agreement (3, 19). Adolescent boys with high levels of sexual risk behaviour may increase the risks of contracting STDs of their sexual partners with lower levels of sexual risk behaviour (21). Sexual abuse and sexual coercion tend to happen to women, especially adolescent girls,

rather than to men. Adolescent girls are often forced by their boyfriends to have sex (15). Eleven percent of Ghanaian sexually experienced adolescent girls reported being forced during first sexual encounter, compared with 2% of boys (5). In many African countries, poor adolescent girls are often seduced by older men known as 'sugar daddies' in return for gifts or money; in these cases, they rarely use condoms during sex (3, 11, 17, 19, 28). Adolescent girls are especially in danger in communities where it is believed that HIV/AIDS can be cured by having sex with a virgin. Due to trauma, sexual coercion increases the likelihood that adolescent girls will turn to drug abuse, which is highly associated with the sharing of needles and syringes – a transmission mode of HIV/AIDS (15).

Limited information is available about the relative importance of behavioural factors versus biological factors in determining the risk of STDs among adolescent boys compared to girls (3). However, adolescent girls are more likely to be vulnerable to these diseases due to biological and social factors than boys (2, 3, 11). In sub-Saharan Africa, more girls aged 15-19 years than boys of the same age group are living with HIV/AIDS (7, 11).

Individual knowledge and attitudes regarding STD prevention have direct impact on sexual behaviours. Adolescent girls and boys meet with different difficulties when putting their knowledge and attitudes regarding STD prevention into practice. A study in Uganda revealed that when exposed to the same sex education programme, schoolboys and schoolgirls changed their sexual behaviours in different ways (16). Other factors such as school, family, friends, and religious belief also influence adolescents' behaviours, including sexual activities (1). Sex have different impacts on these factors for adolescent boys and girls. Co-residence with biological parents and religious beliefs have been demonstrated to have dissimilar influences on sexual activities among adolescent boys and girls (30). Limited data is available on the influence of education levels on sexual activities

among adolescent girls and boys, however it is clear that delayed first sexual activity makes it more likely that adolescents will enjoy higher education. The question arises, when they desire to complete higher education, does this desire influence their sexual activities as well? Furthermore, friends have an enormous influence on adolescents' decisions. Thus, participation in clubs may influence sexual activities. The impacts of all these factors on sexual activities among adolescent boys and girls must be investigated further, since a good understanding of these influences may be useful in the development of effective interventions for sexual and reproductive health, including STD prevention.

1.5 Study aim and objectives

The aim of this research report is to examine sex differences in knowledge, attitudes, and practices regarding STD prevention among junior secondary school pupils in the Kassena-Nankana district, Ghana in 2005.

Objectives:

1) To compare knowledge of STD prevention among schoolboys and schoolgirls.
2) To compare attitudes towards STD prevention among schoolboys and schoolgirls.
3) To compare sexual risk behaviours among sexually experienced schoolboys and schoolgirls based on their reported practices.
4) To examine association of knowledge and attitudes regarding STD prevention with sexual activities among schoolboys and schoolgirls.

2.0 METHODOLOGY

2.1 The study setting

The study setting is the Kassena-Nankana district located in the Upper East Region, northern Ghana. This district covering an area of 1,674 km^2 is one of the districts in Ghana bordering Burkina Faso. Navrongo is the capital town of the district (31).

Kassena-Nankana is a poor rural district. Mud houses with straw roofs are still very common; and modern amenities such as electricity and telephones are scarce, except in the urban part of the district. Thus, access to the mass media such as television, radio, and even newspapers is not easy in vast areas of the district. Most people work as farmers for a living. However, the soil is typical of the savanna belt, and this, together with the weather, hinders agricultural development. The rainy season lasts from May to October; the rest of the year is the dry season, characterised by low humidity and dusty harmattan winds (31).

The population of the district in 2005 was 144,980 people, of which the majority belongs to the Kassena and Nankani ethnic groups. There are more women than men (52.5% compared with 47.5%) (32). Most people live in compounds - groups of consanguineous households, which mean that children and adolescents are brought up in their extended families.

Today, basic education – consisting of primary and junior secondary school – is offered free by the Ghanaian government. This has contributed to the rapid rise in school attendance in this district. In the 2006/07 school year, educational facilities in the district included 98 primary schools, 48 junior secondary schools, and seven senior secondary schools. In terms of higher educational institutions, there were three Vocational Training Centres, one Teacher Training College, one Community Nursing Training College, and a faculty of the University for Development Studies. This study was undertaken in junior

secondary schools, which comprise three levels (Form 1, 2, and 3). The notional age range of pupils in junior secondary school is 12-14 years old, but the range is much wider in reality (5).

People living in this district can get health care through a hospital, five health centres, several clinics, and community health officers. In addition, the Navrongo Health Research Centre is regarded as an important part of the health system in the Kassena-Nankana district. The Centre started as a field site for research on the impact of repeated large doses of Vitamin A supplements on child survival in 1988. Thereafter, the infrastructure developed was used to establish a research centre to investigate health problems in order to advise policy makers (33).

In 2002, the project 'Promoting healthy sexual and reproductive health among adolescents in the Kassena-Nankana district of Ghana' was initiated by the Navrongo Health Research Centre. This project focuses on approximately a quarter of the population in this district (32). A study by Mensch et al. indicated that adolescents in this district suffer from the same sexual and reproductive health problems as adolescents in other parts of sub-Saharan Africa (28). In 2003, the prevalence of HIV/AIDS, syphilis, and herpes simplex virus 2 (HSV-2) among people aged 10-24 years were estimated at 1.1%, 0.9%, and 10.5%, respectively. However, the adolescents in the study were poorly informed about STD prevention (4). A series of activities such as peer education and youth-friendly health services have been implemented in order to help adolescents in this district become responsible and sexually healthy adults. In collaboration with the Ghana Education Service, the project has initiated several activities targeted at in-school adolescents in the district. The subject 'Adolescent sexual and reproductive health' has been introduced to nearly half of the junior secondary schools since 2006 as part of an in-school intervention.

Its aim is to equip school pupils with the information and basic skills necessary for good sexual and reproductive health.

2.2 Study design

This research report is based on secondary data analysis of a cross-sectional knowledge, attitude, and practice (KAP) survey on sexual and reproductive health conducted among junior secondary school pupils in the Kassena-Nankana district in 2005.

2.3 Study population and sampling

2.3.1 Study population and sampling of the original survey

All the junior secondary schools in the Kassena-Nankana district in the 2005/06 school year (41 schools) were invited to participate in the original survey. After receiving permission from headmasters, interviewers went into each class and invited all pupils present to participate in the survey. Participation was voluntary.

Permission was obtained from the headmasters of all the junior secondary schools. 6,540 school pupils agreed to participate in the survey. This number represented 99.5% of the school pupils who registered at the junior secondary schools in the Kassena-Nankana district in the 2005/06 school year. The rate of class attendance in this survey was very high. A possible reason for is that the survey coincided with the end-of-term examination period for junior secondary school. The survey was conducted from 24 November to 14 December 2005. Only one school pupil refused to participate in the survey. A small number (33 school pupils) failed to participate in the survey due to being absent from class at the time of the survey.

2.3.2 Study population and sampling for the research report

Due to the emphasis on sex and adolescents in the analyses, the research report selected participants who met both of the following inclusive criteria:

- they had indicated their sex in the questionnaire; and
- they were between 10 and 19 years old.

There were 6,225 school pupils eligible for the research report. This number represented 95.2% of the school pupils participating in the original survey and 94.7% of the junior secondary school pupils enrolled in the Kassena-Nankana district in the 2005/06 school year.

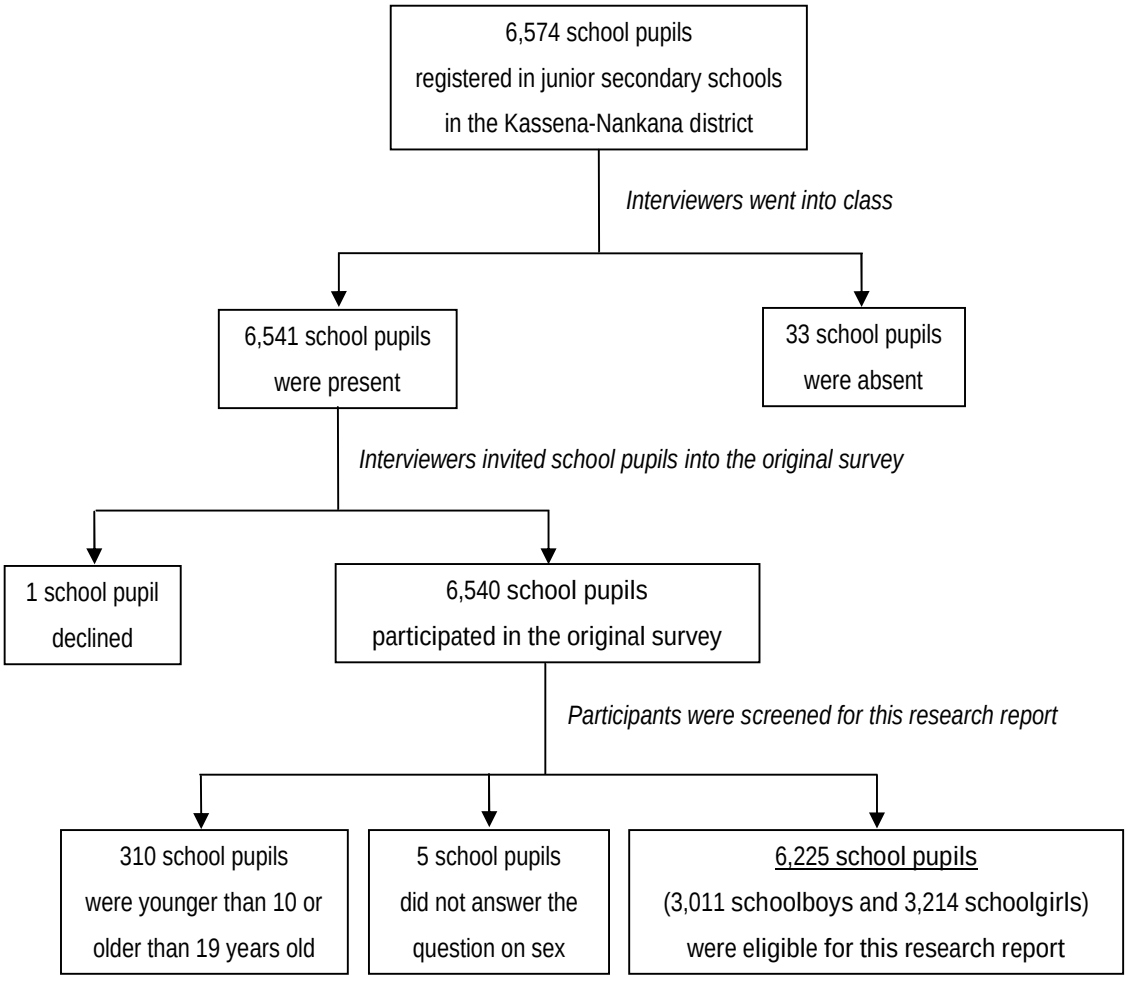


Figure 2.1 Summary of sample selected from the study population

2.4 Secondary data source and measurement

2.4.1 Secondary data source

The cross-sectional KAP survey on sexual and reproductive health was conducted in November and December 2005 among junior secondary school pupils in the Kassena-Nankana district by the Navrongo Health Research Centre. The original survey had been carried out before the subject 'Adolescent sexual and reproductive health' was initiated in half of junior secondary schools in this district. The data were double-entered in order to ensure accuracy.

2.4.2 Measurement

A self-administered and anonymous questionnaire was used in the original survey *(Appendix A)*. The questionnaire was written in English, which is the language of instruction in the Ghanaian school system. However, outside class, school pupils mainly speak local languages (Kassem or Nankam). Thus, in order to facilitate the school pupils' understanding in each class, the questionnaire was explained verbally in the appropriate local language by a fluent experienced interviewer. The interviewer also instructed the school pupils on how to complete the questionnaire.

This research report used 38 of the 72 questions in the questionnaire. These 38 questions cover background information, source of STD-related information, knowledge and attitudes regarding STD prevention, and sexual activities.

2.5 Definition of terms

The following are definitions of words and phrases used in this research report:

- *In the last 12 months:* the twelve-month period preceding the date of the interview.

- *Have sex:* commonly means having penile-vaginal intercourse. This meaning was used by interviewers when they explained the survey questionnaire to participants in local languages. Thus all the participants understood this meaning of the phrase 'have sex' when responding to the questionnaire.

2.6 Data management and analysis

2.6.1 Data management

All missing values were removed from the data analysis. Being sexually inexperienced or experienced was determined by individual responses to seven questions on sexual activities (*Question 403 – 409*). Participants were divided into the following three groups by their self-reported sexual activities:

- *Sexually inexperienced school pupils*: those who consistently reported that they had never had sex and had not been pregnant (for a girl), or had not made a girl pregnant (for a boy).
- *Sexually experienced school pupils:* those who consistently reported having sex. In addition, they reported their sexual activities logically. For instance, the reported age at first sex was not greater than the current age; number of sexual partners in the last 12 months was not more than number of life-time sexual partners.
- *Unsure:* the rest of the participants. These people had inconsistent or illogical answers to questions on sexual practices or had not answered any of these questions. They formed 21.0% of boys and 13.4% of girls. This group was excluded from analysis of sexual behaviour.

Some variables were recoded to simplify analysis and interpretation. Religion consisted of four categories: (i) *Christian*; (ii) *Moslem*; (iii) *Traditional*; and (iv) *No religion*. Co-

residence referred to living with biological parents at the time of the survey. This variable was categorized as follows: (i) *Both parents*; (ii) *Only mother*; (iii) *Only father*; and (iv) *Neither parent*.

There are 14 questions on STD-related knowledge in the questionnaire. They cover eight issues of STD-related knowledge. The number and structure of questions and answers on issues are not the same.

Table 2.1 Issues of STD-related knowledge mentioned in the questionnaire

Issues of STD-related knowledge	Question
Effect of delaying sex till later in life	227
Definition of unprotected sex	213
Names of STDs	228
Symptoms of STDs	229
Consequences of delayed treatment of STDs	214
Modes of HIV transmission	217 – 220
Modes of HIV prevention	221 – 224
Can a healthy-looking person be HIV positive?	313

To facilitate the comparison between boys and girls, the degree of accuracy of the answers to the questions on each issue was evaluated as follows:

- If all answers were correct, the respondent had *correct* knowledge of the particular issue.
- If some answers were correct but others were wrong or 'do not know/unsure', the respondent had *partly correct* knowledge of that issue.
- If all answers were wrong, the respondent had *incorrect* knowledge of that issue.
- If all answers were 'do not know/unsure', the respondent *did not know* or *was unsure* about that issue.

To facilitate evaluation of overall STD-related knowledge as well as examination of association of knowledge and attitudes regarding STD prevention with sexual activities, the STD-related knowledge scores were computed. These might be regarded as marks for a test on STD-related knowledge for school pupils.

- In the case of this study, it was assumed that the measures of STD-related knowledge mentioned above played equally important roles. The score that was assigned to each issue was 10.
- The score for a correct answer in the particular issue depended on the number of correct answers available in that particular issue, that is 10 divided by the number of correct answers available in that issue. Due to consideration of the effect of incorrect answers, the score for an incorrect answer was set as equal to the negative of the score of a correct answer to questions on the same issues. The score for the answer 'don't know/unsure' equalled 0. The total score of an issue was summarized by all the scores for the answers to questions on that issue. If the total score of an issue was less than 0, it was converted from negative into 0. This conversion helps avoid the interaction of issue scores in the final summary of the STD-related knowledge score.
- The STD-related knowledge score was finally summarized by the scores of the eight above-mentioned issues. Thus the knowledge score that a school pupil obtained might lie between 0 and 80.

2.6.2 Data analysis

The data were analysed using the Stata™ version 9.0 software with the significance level of statistical tests fixed at 0.05. Descriptive analysis was performed to give background information of the school pupils and sources of pupils' STD education. Relative frequency was calculated within groups of school pupils categorized by sex, or by sex and sexual

experience combined. χ^2-test and t-test were used to analyse the categorical variables and continuous variables respectively to compare knowledge, attitudes, and practices between boys and girls. No confounders were adjusted in these comparisons, because our aim is merely to find out if there are differences between the two sexes or not.

Logistic regression models fitted for each sex were used to examine the association of knowledge and attitudes regarding STD prevention with sexual activities among girls and boys.

- Outcome variables (one for each model): In this research report, it was assumed that current knowledge and attitudes regarding sexual and reproductive health affect recent sexual practices rather than much earlier practices. Due to emphasis on identification of association between sexual activities and knowledge and attitudes regarding STD prevention, recent sexual activities were used as the outcome variables in the models. These outcome variables included having sex in the last 12 months and having multiple sexual partners in the last 12 months.
- Explanatory variables: STD-related knowledge scores, variables related to attitudes towards STDs, and variables regarding background information were put in logistic regression models as the explanatory variables. There appeared some explanatory variables with less than five observations in their categories, which might cause improper estimates in logistic regression models. Such variables were therefore re-grouped into two categories: (i) the existing category which included most participants, and (ii) a combination of the rest. This enabled maximal exploitation of the available explanatory variables.

First, univariate logistic regression models were carried out to determine factors associated with sexual activities. Then, multiple logistic regression models were fitted in order to

adjust for potential confounders. Potential confounders may be any of the explanatory variables apart from the main one. Due to interest in association of knowledge and attitudes regarding STD prevention with sexual activities, STD-related knowledge scores and variables relating to attitudes towards STDs were put in the multiple models. In addition, variables regarding background information were also put in the multiple models if they had significant results in the univariate models.

2.7 Ethical considerations

2.7.1 Ethical considerations of the original survey

The KAP survey of sexual and reproductive health conducted among junior secondary school pupils in the Kassena-Nankana district in 2005 is one of several research activities carried out within the broader project 'Promoting healthy sexual and reproductive health among adolescents in the Kassena-Nankana district of Ghana'. The overall project obtained ethical approvals from the Health Research Unit of the Ghana Health Service and the Institutional Review Board of the Navrongo Health Research Centre in 2002 *(Appendix C)*. The KAP survey also obtained permission from Ghana Education Service in 2005 *(Appendix C)*.

The following approach was used in the junior secondary schools: first, the authorities of schools were approached for permission for their schools to participate in the survey. They were informed about the aim of the survey, data collection procedures, voluntary participation in and withdrawal from the survey, etc. After obtaining approval from the authorities [headmasters signed an informed consent sheet *(Appendix B)*], the study was explained to pupils in the schools. The school pupils answered the questionnaire after signing another informed consent sheet *(Appendix B)*. Participation in the survey was voluntary.

2.7.2 Ethical considerations in this research report

The protocol of this research report obtained ethical clearance from the University of the Witwatersrand Committee for Research on Human Subjects (Medical) in October 2006 and from the Institutional Review Board of the Navrongo Health Research Centre in January 2007 *(Appendix D)*.

3.0 RESULTS

3.1 General information

Of the 6,225 school pupils included in these analyses, numbers of boys and girls were fairly equal (48% and 52% respectively). The mean age of the participants was 15.8 ± 1.8 years old. The majority of boys and girls consistently and logically reported that they had never had sex; the proportion of girls (79%) reporting in this way was higher than that of boys (65%).

Table 3.1 synthesizes the background information of sexually inexperienced and sexually experienced school pupils both separately and collectively for each sex. Distributions in the three levels of junior secondary school differed between boys and girls. However, the proportion of sexually experienced boys and girls was highest in Form 2 (41% of boys and 39% of girls). The mean age of boys and girls was 16.1 and 15.6 years old, respectively. The mean ages of school pupils who reported being sexually experienced appear higher among boys than among girls (16.9 compared with 15.9 among boys and 16.6 compared with 15.4 among girls).

The Christian religion – including various branches such as Catholic and Bible Church of Africa – was the main religion of school pupils (75% of boys and 90% of girls). Only a small percentage of school pupils did not identify with any religion. About 60% of school pupils lived with both biological parents at the time of the survey. School pupils living with only their biological father formed the lowest percentage (8% of boys and 5% of girls). Three of four school pupils in each sex reported that they would like to complete tertiary education; the percentage of sexually inexperienced school pupils with this desire was higher than that of sexually experienced ones in both sexes. About half of boys and half of girls belonged to clubs in school.

Table 3.1 Background information of the school pupils

Variables	Schoolboys n (%)			Schoolgirls n (%)		
	Sexually inexperienced n = 1,941	Sexually experienced n = 438	Total * n = 3,011	Sexually inexperienced n = 2,553	Sexually experienced n = 232	Total * n = 3,214
Education level						
Form 1	763 (39.3)	149 (34.0)	1,180 (39.2)	867 (34.0)	61 (26.3)	1,122 (34.9)
Form 2	704 (36.3)	178 (40.6)	1,117 (37.1)	971 (38.0)	90 (38.8)	1,207 (37.6)
Form 3	474 (24.4)	111 (25.4)	714 (23.7)	715 (28.0)	81 (34.9)	884 (27.5)
Age (mean ± SD)	15.9 (± 1.9)	16.9 (± 1.7)	16.1 (± 1.9)	15.4 (± 1.6)	16.6 (± 1.6)	15.6 (± 1.7)
Religion						
Christian	1,478 (76.1)	315 (71.9)	2,248 (74.6)	2,311 (90.5)	192 (82.7)	2,888 (89.9)
Moslem	173 (8.9)	52 (11.9)	282 (9.4)	190 (7.4)	32 (13.8)	253 (7.9)
Traditional	240 (12.4)	56 (12.8)	401 (13.3)	40 (1.6)	3 (1.3)	53 (1.6)
No religion	50 (2.6)	15 (3.4)	80 (2.7)	12 (0.5)	5 (2.2)	20 (0.6)
Co-residence with						
Both parents	1,205 (62.2)	227 (51.8)	1,850 (61.5)	1,637 (64.1)	114 (49.1)	2,006 (62.5)
Only mother	373 (19.2)	105 (24.0)	579 (19.2)	485 (19.0)	54 (23.3)	615 (19.1)
Only father	145 (7.5)	37 (8.5)	231 (7.7)	116 (4.6)	14 (6.0)	163 (5.1)
Neither parent	215 (11.1)	69 (15.7)	348 (11.6)	314 (12.3)	50 (21.6)	427 (13.3)
Desired highest education level						
Junior secondary school	18 (1.0)	9 (2.1)	43 (1.4)	22 (0.9)	4 (1.7)	43 (1.3)
Senior secondary school	144 (7.4)	34 (7.8)	234 (7.8)	254 (10.0)	23 (9.9)	330 (10.3)
Above senior secondary school	1,530 (78.8)	313 (71.4)	2,293 (76.1)	1,938 (75.9)	171 (73.7)	2,382 (74.2)
Do not know/Unsure	249 (12.8)	82 (18.7)	441 (14.7)	338 (13.2)	34 (14.7)	457 (14.2)
Participation in any school clubs						
Yes	993 (51.2)	231 (52.7)	1,572 (52.2)	1,207 (47.3)	112 (48.3)	1,558 (48.5)
No	947 (48.8)	207 (47.3)	1,438 (47.8)	1,343 (52.7)	120 (51.7)	1,652 (51.5)

** The totals are the sum for the participants of the three following groups: (i) Sexually experienced school pupils, (ii) Sexually inexperienced school pupils, and (iii) Unsure.*

School and health workers were the only two sources of STD-prevention education explored in the questionnaire. Table 3.2 describes the percentage of school pupils receiving information from these two sources in the last 12 months. An investigation of four STD-related topics taught at school (HIV/AIDS, other STDs, How to say 'No' to sex, and Abstinence) showed that nearly all the boys and girls received lessons on at least one topic in school. More than eighty percent of school pupils received lessons on STDs, including HIV/AIDS, in school. A far lower percentage received such information from health workers (67% of boys and 65% of girls).

Table 3.2 Sources and content of STD-related information

Variables	Schoolboys n (%)			Schoolgirls n (%)		
	Sexually inexpe-rienced n = 1,941	Sexually expe-rienced n = 438	Total * n = 3,011	Sexually inexpe-rienced n = 2,553	Sexually expe-rienced n = 232	Total * n = 3,214
From schools	1,871 (96.4)	424 (96.8)	2,901 (96.4)	2,455 (96.2)	224 (96.6)	3,087 (96.1)
HIV/AIDS	1,734 (89.3)	394 (90.0)	2,669 (88.6)	2,276 (89.2)	201 (86.6)	2,835 (88.2)
Other STDs	1,606 (82.8)	381 (87.0)	2,510 (83.5)	2,119 (83.1)	198 (85.3)	2,629 (81.9)
How to say 'No' to sex	1,310 (67.5)	299 (68.3)	2,016 (67.0)	1,819 (71.3)	170 (73.3)	2,253 (70.2)
Abstinence	1,390 (71.7)	294 (67.1)	2,109 (70.1)	1,778 (69.6)	164 (70.7)	2,229 (69.4)
From health workers (Topic: STDs)	1,275 (65.7)	302 (69.0)	2,026 (67.3)	1,647 (64.5)	161 (69.4)	2,095 (65.2)

** The totals are the sum for the participants of the three following groups: (i) Sexually experienced school pupils, (ii) Sexually inexperienced school pupils, and (iii) Unsure.*

When the number of topics participants received from school was considered, just about half of school pupils received lessons on all four topics (49% of boys and 50% of girls). Four percent of school pupils reported receiving no lessons *(Not presented in Table 3.2)*.

3.2 Knowledge of sexually transmitted disease prevention

Table 3.3 Knowledge of STD prevention among schoolboys and schoolgirls

Variables	Schoolboys n (%)	Schoolgirls n (%)	p-value
Effect of delayed sex till later in life			
Correct	964 (32.0)	1,039 (32.3)	p = 0.559
Partly correct	1,999 (66.4)	2,113 (65.8)	
Incorrect	47 (1.6)	61 (1.9)	
Definition of unprotected sex			
Correct	2,105 (69.9)	2,030 (63.2)	
Incorrect	743 (24.7)	878 (27.3)	p < 0.001
Do not know	163 (5.4)	306 (9.5)	
Names of STDs			
Correct	56 (1.8)	78 (2.4)	
Partly correct	2,932 (97.4)	3,111 (96.8)	p = 0.304
Incorrect	23 (0.8)	24 (0.8)	
Symptoms of STDs			
Correct	169 (5.6)	188 (5.9)	
Partly correct	2,648 (87.9)	2,818 (87.7)	p = 0.921
Incorrect	194 (6.5)	207 (6.4)	
Consequence of delayed treatment of STDs			
Correct	1,294 (43.0)	1,363 (42.4)	
Incorrect	1,299 (43.2)	1,302 (40.5)	p = 0.001
Do not know	416 (13.8)	548 (17.1)	
Modes of HIV transmission			
Correct	2,149 (71.5)	2,173 (67.8)	
Partly correct	849 (28.3)	1,028 (32.0)	p = 0.014
Incorrect	2 (0.1)	2 (0.1)	
Do not know	3 (0.1)	4 (0.1)	
Modes of HIV prevention			
Correct	714 (23.7)	683 (21.3)	
Partly correct	2,254 (75.0)	2,469 (77.0)	p = 0.096
Incorrect	33 (1.1)	44 (1.4)	
Do not know	6 (0.2)	9 (0.3)	
A healthy-looking person can be HIV positive?			
Correct	2,262 (75.2)	2,298 (71.5)	
Incorrect	639 (21.2)	731 (22.8)	p < 0.001
Do not know	108 (3.6)	183 (5.7)	
STD-related knowledge score [mean (95% CI)]	40.8 (40.3; 41.3)	39.3 (38.8; 39.8)	p < 0.0001

Table 3.3 summarizes percentages of boys and girls by the degree of accuracy of their answers to questions on each issue of STD-related knowledge. The majority of boys and

girls correctly identified the definition of unprotected sex and modes of HIV transmission. Seventy percent of boys and 63% of girls reported that unprotected sex is sex without the use of condoms. The percentage of boys and girls who correctly listed modes of HIV transmission was 72% and 68%, respectively. Three of four school pupils correctly reported that a healthy-looking person can be HIV positive. Less than half of both boys and girls answered correctly to consequence of delayed treatment of STDs. In regard to other issues, the percentages of boys and girls giving partly correct answers were both far higher than those giving correct answers. Although the majority of school pupils identified modes of HIV transmission correctly, a far lower percentage did so when it came to methods of HIV prevention.

When differences between boys and girls are considered, there are significant differences in answers relating to definition of unprotected sex, consequence of delayed treatment of STDs, mode of HIV transmission, and an affirmation that a healthy-looking person can be HIV positive. The percentage of boys who gave the correct answers to these issues of STD-related knowledge was significantly higher than that of girls. Apart from modes of HIV transmission, more girls than boys reported that they do not know about the above-mentioned issues.

An examination of knowledge scores showed that the school pupils had a low level of awareness of STDs and preventive methods. The mean score (± SD) is 40.0 (± 14.2). Among 6,194 school pupils whose STD-related knowledge was scored, only one could give the correct answers to all the questions and get the maximum knowledge score (80), nine school pupils obtained the minimum knowledge score (0). *(Not presented in Table 3.3)*. Although the difference in the mean knowledge score was small, girls presented a significantly lower knowledge score than boys.

3.3 Attitudes towards sexually transmitted disease prevention

There were significant differences in attitudes towards STD prevention between boys and girls. Their opinions on teaching the use of condoms to people of their age were also dissimilar. These results are presented in Table 3.4.

Table 3.4 Attitudes towards STD prevention among schoolboys and schoolgirls

Variables	Schoolboys n (%)	Schoolgirls n (%)	p-value
Self-perceived risk of contracting HIV/AIDS			
Great	602 (20.0)	515 (16.0)	
Moderate	351 (11.7)	410 (12.8)	
Small	719 (23.9)	570 (17.8)	p < 0.001
No risk at all	853 (28.4)	956 (29.8)	
Do not know/Unsure	482 (16.0)	756 (23.6)	
Ability to insist on condom use			
Yes	2,104 (69.9)	1,973 (61.4)	
No	726 (24.1)	850 (26.5)	p < 0.001
Do not know/Unsure	180 (6.0)	390 (12.1)	
Acceptance of sex without condoms			
Yes	448 (14.9)	347 (10.8)	
No	2,492 (82.8)	2,724 (84.9)	p < 0.001
Do not know/Unsure	70 (2.3)	139 (4.3)	
Teaching young people about condoms encourages them to have sex			
Yes	1,252 (41.6)	1,096 (34.1)	
No	1,648 (54.7)	1,931 (60.1)	p < 0.001
Do not know/Unsure	111 (3.7)	186 (5.8)	

Twenty percent of boys and 16% of girls considered themselves at great risk of getting HIV/AIDS. Twelve percent of boys and 13% of girls thought their chance of acquiring HIV/AIDS was moderate. Half of school pupils reported that they had a small chance, or even no chance, of contracting HIV/AIDS. A considerable number of school pupils could not determine their risk level, the percentage of boys (16%) in this respect being far lower than that of girls (24%).

In terms of condom use, a higher percentage of boys (70%) than girls (61%) felt confident about insisting on condom use whenever they had sex. However, the percentage of school pupils who would accept to have sex with someone who was not prepared to use a condom was also higher among boys (15%) than among girls (11%). Fifty-five percent of boys and 60% of girls disagreed with the statement that teaching young people about condoms encourages them to have sex ($p < 0.05$).

3.4 Sexual risk behaviours based on school pupils' reported practices

Table 3.5 Sexual activities among schoolboys and schoolgirls

Variables	Schoolboys n (%)	Schoolgirls n (%)	p-value
Ever had sex *			
Yes	438 (18.4)	232 (8.3)	p < 0.001
No	1,941 (81.6)	2,553 (91.7)	
Age of sexual debut † ¶	14.5 (14.2; 14.8)	15.1 (14.8; 15.5)	p = 0.0189
Had sex in the last 12 months ‡			
Yes	347 (79.2)	189 (81.5)	p = 0.49
No	91 (20.8)	43 (18.5)	
Had multiple lifetime sexual partners ‡			
Yes	272 (62.1)	73 (31.5)	p < 0.001
No	166 (37.9)	159 (68.5)	
Number of lifetime sexual partners ‡ ¶	4.2 (3.8; 4.7)	2.5 (2.1; 3.0)	p < 0.0001
Had multiple sexual partner in the last 12 months §			
Yes	179 (51.6)	35 (18.5)	p < 0.001
No	168 (48.4)	154 (81.5)	
Number of sexual partners in the last 12 months § ¶	3.1 (2.7; 3.4)	1.9 (1.5; 2.3)	p = 0.0001
Non-use of condoms during first sexual encounter ‡			
Non-use	111 (25.3)	50 (21.6)	p = 0.275
Use	327 (74.7)	182 (78.5)	
Non-use of condoms during last sexual encounter ‡			
Non-use	164 (37.4)	67 (28.9)	p = 0.026
Use	274 (62.6)	165 (71.1)	

* Among school pupils who had consistently and logically answered to the questions on sexual activities.
† Among the sexually experienced school pupils who remembered the age of sexual debut
‡ Among the sexually experienced school pupils
§ Among the sexually experienced school pupils who had had sex in the last 12 months
¶ Mean (95% CI)

Approximately 80% of school pupils provided consistent and logical answers to the questions on sexual activities (79% of boys and 87% of girls). Of these pupils, the majority reported that they had never had sex at the time of the survey. Table 3.5 describes sexual risk behaviour based on the school pupils' self-reported practices.

Many more boys than girls reported having engaged in sexual activities, 18% compared with 8% ($p < 0.05$). Boys started having sex earlier than girls (at 14.5 compared with 15.1 year, $p < 0.05$). The majority of sexually experienced school pupils had sex in the last 12 months (79% of boys and 82% of girls); there did not appear to be a significant difference in these percentages between boys and girls.

In terms of number of sexual partners, most boys had sex with two or more lifetime partners but most girls reported only one sexual partner ($p < 0.05$). The mean number of lifetime sexual partners among boys was 4.2. The number among girls was significantly lower (2.5 partners). Among school pupils who had sex in the last 12 months, approximately 52% of boys had multiple sexual partners but only 19% of girls did so. The mean number of sexual partners in the last 12 months among boys is about one person more than among girls ($p < 0.05$). Information on concurrent sexual partners was not available in the data.

Condom use during first and last sexual encounters was explored. More boys than girls did not report using condoms during their first and last sexual encounters. Twenty-five percent of boys did not use condoms during first sexual encounter and neither did 22% of girls. A far higher percentage of boys (37%) than girls (29%) did not use condoms during last sexual encounter. There is only a significant difference in non-use of condoms between boys and girls during last sexual encounter, not in first sexual encounter. Non-use of

condoms tended to increase from first to last sexual encounter in both sexes: from 25% to 37% of boys and from 22% to 29% of girls.

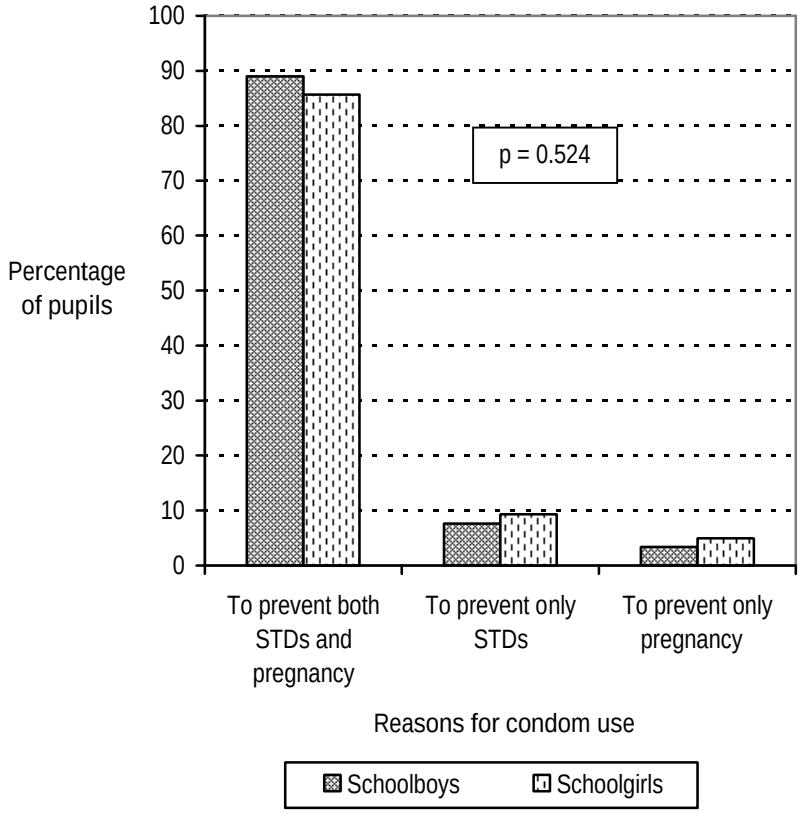


Figure 3.1 Reasons for condom use during first sexual encounter

Figure 3.1 shows reasons for condom use during first sexual encounter among boys and girls. Most of the school pupils using condoms during first sexual encounter reported that they had used condoms to prevent both STDs and pregnancy. However, about 10% reported that they used condoms to prevent either STDs or pregnancy (11% of boys and 14% of girls). There were no significant differences in reasons for condom use during first sexual encounter between boys and girls.

Figure 3.2 shows percentages of boys and girls by condom use during first and last sexual encounters. Fifty-nine percent and 66% of sexually experienced boys and girls respectively

used condoms during both first and last sexual encounters ($p > 0.05$). About 20% did not use condoms during either first or last sexual encounter. The remainder used condoms during neither first nor last sexual encounter.

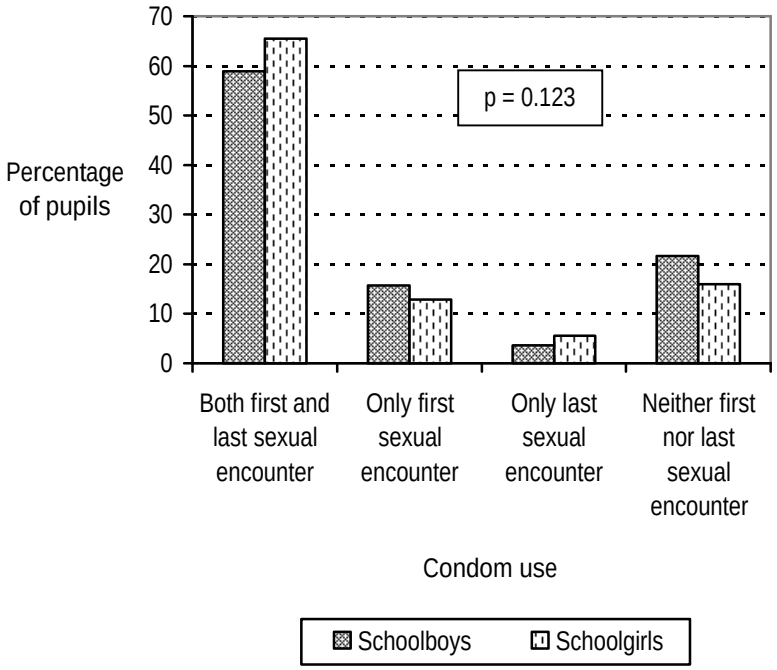


Figure 3.2 Summary of condom use during first and last sexual encounters

3.5 Association of knowledge and attitudes with practices

Tables 3.6 and 3.7 display the results of the univariate and multiple logistic regression models. These models were used to examine association of knowledge and attitudes regarding STD prevention with sexual activities among boys and girls (having sex in the last 12 months and having multiple sexual partners in the last 12 months).

In terms of having sex in the last 12 months, self-perceived risk of contracting HIV/AIDS, education level, and age had significant effects in the univariate model for boys. Compared with boys considering themselves at great risk of contracting HIV/AIDS, those who did not

know their own risk were 73% less likely to have sex in the last 12 months. This result remained unchanged in the multivariate model. Acceptance of sex without a condom was not a significant factor found in the univariate model. However, it was a significant factor in the multivariate model. Boys who reported that they would accept having sex with someone who was not prepared to use a condom, or were unsure about their acceptance, were 45% less likely to have sex in the last 12 months than others. Among girls, the STD-related knowledge score, age, co-residence, and desired highest education level were significant factors found in the univariate models. However, STD-related knowledge score was not associated with having sex in the last 12 months based on the result of the multivariate model.

Regarding multiple sexual partners in the last 12 months among boys, knowledge and attitudes regarding STD prevention were not associated with this practice. Education level and being Christian had significant results in the univariate model. However, only being Christian was a significant factor in the multivariate model. Among girls, STD-related knowledge score was the only significant factor found in both the univariate and multiple logistic regression models. When STD-related knowledge score increases, it leads to a slight decrease in the probability of having more than two sexual partners in the last 12 months among girls (the probability declined 4% for each unit of increase in knowledge).

Table 3.6 Factors associated with having sex in the last 12 months

Variables	Schoolboys n = 438		Schoolgirls n = 232	
	Univariate OR (95% CI)	Multiple OR (95% CI)	Univariate OR (95% CI)	Multiple OR (95% CI)
STD-related knowledge score	1 (0.99; 1.02)	0.99 (0.97; 1.01)	1.03 (1.01; 1.06)	1.02 (1.00; 1.05)
Self-perceived risk of contracting HIV/AIDS				
Great	1	1	1	1
Moderate	1.22 (0.48; 3.08)	1.21 (0.47; 3.15)	1.57 (0.45; 5.52)	1.82 (0.46; 7.20)
Small	0.81 (0.39; 1.66)	0.78 (0.37; 1.64)	2 (0.57; 6.96)	2.59 (0.66; 10.21)
No risk at all	0.69 (0.34; 1.41)	0.73 (0.36; 1.52)	1.17 (0.39; 3.52)	1.52 (0.45; 5.17)
Do not know/Unsure	0.37 (0.17; 0.80)	0.37 (0.17; 0.82)	0.97 (0.32; 2.90)	1.74 (0.50; 6.09)
Ability to insist on condom use				
Yes	1	1	1	1
No + Do not know/Unsure	1.26 (0.73; 2.19)	1.65 (0.91; 2.96)	2.24 (0.98; 5.11)	2.44 (1.00; 5.96)
Acceptance of sex without condom				
No	1	1	1	1
Yes + Do not know/Unsure	0.63 (0.37; 1.08)	0.55 (0.31; 0.98)	0.89 (0.38; 2.10)	1.01 (0.37; 2.78)
Education level				
Form 1	1	1	1	
Form 2	1.82 (1.06; 3.13)	1.49 (0.83; 2.65)	1.62 (0.71; 3.69)	
Form 3	1.36 (0.75; 2.44)	1.12 (0.59; 2.13)	1.31 (0.58; 2.97)	
Age	1.17 (1.03; 1.34)	1.16 (1.01; 1.34)	1.41 (1.15; 1.73)	1.42 (1.14; 1.78)
Being Christian				
Yes	1		1	
No	1.39 (0.81; 2.38)		0.53 (0.24; 1.16)	
Co-residence with				
Both parents	1		1	1
Only mother	1.32 (0.71; 2.43)		0.43 (0.19; 0.98)	0.36 (0.14; 0.88)
Only father	0.69 (0.31; 1.52)		0.27 (0.08; 0.92)	0.25 (0.06; 1.02)
Neither of parents	0.72 (0.38; 1.35)		0.69 (0.28; 1.70)	0.65 (0.24; 1.72)
Desired highest education level is above senior secondary school				
Yes	1		1	1
No	0.87 (0.53; 1.44)		0.46 (0.23; 0.93)	0.42 (0.18; 0.96)
Participation in any school clubs				
Yes	1		1	
No	0.90 (0.56; 1.42)		0.82 (0.42; 1.59)	

Underlined values were statistically significant.

Table 3.7 Factors associated with having multiple sexual partners in the last 12 months

Variables	Schoolboys n = 347		Schoolgirls n = 189	
	Univariate OR (95% CI)	Multiple OR (95% CI)	Univariate OR (95% CI)	Multiple OR (95% CI)
STD-related knowledge score	1 (0.98; 1.01)	1.01 (0.99; 1.02)	0.96 (0.94; 0.99)	0.96 (0.93; 0.98)
Self-perceived risk of contracting HIV/AIDS				
Great	1	1	1	1
Moderate	1.38 (0.67; 2.81)	1.56 (0.74; 3.30)	1.02 (0.28; 3.69)	0.87 (0.23; 3.29)
Small	1.21 (0.66; 2.22)	1.20 (0.64; 2.24)	0.75 (0.21; 2.67)	0.68 (0.18; 2.52)
No risk at all	1.45 (0.79; 2.68)	1.44 (0.77; 2.72)	0.53 (0.15; 1.93)	0.40 (0.10; 1.52)
Do not know/Unsure	0.65 (0.30; 1.42)	0.69 (0.30; 1.55)	0.61 (0.17; 2.20)	0.40 (1.10; 1.59)
Ability to insist on condom use				
Yes	1	1	1	1
No + Do not know/Unsure	1.20 (0.74; 1.94)	1.13 (0.68; 1.87)	1.02 (0.47; 2.22)	0.83 (0.37; 1.88)
Acceptance of sex without condom				
No	1	1	1	1
Yes + Do not know/Unsure	1.36 (0.79; 2.35)	1.34 (0.75; 2.41)	1.29 (0.51; 3.28)	0.94 (0.34; 2.61)
Education level				
Form 1	1	1	1	
Form 2	1.01 (0.62; 1.66)	1.04 (0.61; 1.75)	1.77 (0.68; 4.64)	
Form 3	0.53 (0.30; 0.94)	0.55 (0.30; 1.01)	1.02 (0.36; 2.91)	
Age	0.92 (0.81; 1.04)		1.20 (0.91; 1.57)	
Being Christian				
Yes	1	1	1	
No	1.90 (1.19; 3.06)	1.84 (1.12; 3.02)	0.90 (0.32; 2.56)	
Living with both parents				
Yes	1		1	
No	0.89 (0.58; 1.35)		0.79 (0.38; 1.66)	
Desired highest education level is above senior secondary school				
Yes	1		1	
No	0.94 (0.59; 1.51)		0.97 (0.41; 2.32)	
Participation in any school clubs				
Yes	1		1	
No	0.77 (0.51; 1.18)		0.51 (0.24; 1.08)	

Underlined values were statistically significant.

4.0 DISCUSSION

4.1 Knowledge, attitudes, and practices among school pupils

Sexual and reproductive health matters are part of family life education taught in Ghanaian basic and secondary education (5). Therefore, junior secondary schools in the Kassena-Nankana district had already been involved in provision of STD-related lessons to school pupils before we undertook this study. However, information provided for school pupils were limited. The various topics related to STD prevention received unequal attention. The HIV/AIDS pandemic and the numerous global prevention strategies became the most common topic for STD-related lessons in schools in this district. This seems to be the case in other areas as well. Adolescents therefore tend to know more about HIV/AIDS than other STDs (5, 10, 17). Our study finds that more lessons pertaining to knowledge were taught than lessons designed to provide skills. This imbalance may lead to unsatisfactory outcomes, as in Brazil, where a study revealed that all school pupils knew about the sexual transmission route of HIV but many of them still engaged in sexual risk behaviours (10). Although abstinence is regarded as the best method of STD prevention among this age group, lessons on abstinence and how to say 'No' to sex were reported by only about 70% of school pupils. STD-education programmes lacking lessons on these two topics might not produce desirable effects on school pupils, many of whom have not yet had sex.

Results from this study show that school pupils in the Kassena-Nankana district were poorly informed about STDs. This is consistent with the findings from a study conducted among people aged 10-24 years in the same district in 2003 and the national survey of adolescents in 2004 (4, 5). One in ten school pupils in our study consistently and logically reported already having had sex. A considerable percentage reported non-use of condoms or multiple sexual partners, which may have exposed them to STDs. One-quarter of school

pupils did not use condoms during their first sexual encounter. Reasons for non-use of condoms were not available in the data.

However, this study finds lack of basic information on condoms among adolescents when they start to have sex. A considerable number of school pupils did not know the dual protection capacity of condoms against STDs and pregnancy: 10% of school pupils using condoms during first sexual encounter reported that they used condoms to prevent either STDs or pregnancy, but not both. A qualitative study conducted in Ghana, Burkina Faso, Uganda, and Malawi found that many adolescents knew that condoms protect against STDs, but were not aware of condoms' role in preventing pregnancy (19). This shows that there is a need for adolescents to be educated about condom use. In addition to education programmes, policy makers should pay attention to increased accessibility of condoms for adolescents. At present, condoms are not offered free in Ghana. Most school pupils in this district are poor; hence, even when they know about this preventive method, they cannot afford to pay for condoms. Even pupils who know about the protective capacities of condoms and find them cheap may still not be able to buy them due to fear of disclosure of their intentions (19).

Results indicate a decrease in condom use from first to last sexual encounter in both sexes. The same pattern was found in a study conducted among people aged 10-24 years in this district in 2003 (30). Is this a sign of increased involvement in unprotected sex among school pupils? Available data do not provide sufficient evidence to answer this question. It needs to be investigated in subsequent studies.

Approximately 80% of sexually experienced school pupils had sex in the last 12 months. Information on whether or not they had first sexual encounter in the last 12 months is not available in the data. The study suggests that more intensive efforts to encourage sexually

experienced school pupils to avoid sex or at least protect themselves during sex are, therefore, necessary. Abstinence from sex is an ideal method to protect adolescents, especially when they meet with difficulties in accessing condoms. Although it is not easy to persuade adolescents to postpone sex until marriage, there is still need to let them know about the benefits of delayed sex (19).

If children start school at the age of six as expected and they continue attendance at school without interruption, they will be in junior secondary school between 12 and 14 years of age. The mean age of sexual debut found in this study was 14.5 years old for boys and 15.1 years old for girls. Rates of school attendance are getting higher and higher. This means that STD-prevention education at junior secondary school could cover not only most adolescents but also the majority of school pupils before first sexual encounter. These findings support the implementation of STD-prevention education at junior secondary school.

4.2 Sex differences in knowledge, attitudes, and practices

There appeared some differences in knowledge, attitudes, and practices regarding STD prevention between boys and girls. Sex differences observed in this study indicate a need for sex-separate sex education programmes. This was also suggested in previous studies (5, 6, 11, 13, 16-18). Basic messages may be the same, but they must be given to school pupils in different ways. In the 2006/07 school year, there was only one single-sex junior secondary school for girls in the Kassena-Nankana district, all others being co-ed. In addition to general lessons taught in mixed class, sex-specific lessons can be provided through out-of-class activities to compensate for sex differences.

Results show that boys are more knowledgeable about STD prevention than girls. This finding is similar to those of previous studies conducted in Ghana and other African

countries (6, 19). The difference can be explained by cultural traditions in this area. Traditionally, virginity is regarded as an invaluable attribute of unmarried girls in Ghana (27). As a consequence, girls cannot seek information on STDs on their own initiative. Conversely, boys can openly discuss sexual matters, including STDs, with friends or adults. At present, there are several national education programmes on sexual and reproductive health in Ghana. However, during sex and reproductive health lessons in mixed classes, embarrassment may reduce girls' capacity to acquire information. Therefore, apart from general lessons taught in mixed classes, girl-only lessons must be organized in order to enhance girls' knowledge of STDs.

Boys and girls also had different attitudes towards STD prevention. The percentage of boys feeling confident about insisting on condom use whenever they had sex was higher than that of girls. This can be explained by the generally passive role of girls in sexual relations with boys. Condom use usually depends on men's decisions (3). Moreover, at present, due to high price and limited availability, female condoms are used less commonly than male condoms in this district. This suggests a need to provide girls with the skills necessary to negotiate condom use with their sexual partners. In addition, an increase in accessibility of female condoms is needed.

In spite of a higher knowledge of STD prevention, boys were less likely to put the three basic approaches to STD prevention into practice than girls. Boys started having sex earlier than girls. A higher percentage of boys reported being sexually experienced than girls. A recent study conducted among people aged 10-24 years in the district showed that 17% of males reported having had sex compared with 12% of females (30). Results of our study in this respect are similar to those of other studies on sexual and reproductive health among adolescents conducted in developing and developed countries (8, 9, 22, 23). However, they

are different from the results of the 2004 Ghana national survey among people aged 12-19 years: 17% of girls reported having sex compared with 9% of boys (5). Abstinence from sex is regarded as an ideal method of protecting young people against STDs. In a report on adolescent sexual and reproductive health in Ghana, Awusabo-Asare et al. noted that traditionally girls, but not boys, are supposed to remain virgins until first marriage (27). Beside encouraging girls to continue to follow this protective tradition, it is necessary to encourage boys to delay the onset of sexual debut as well.

More boys than girls could explain what is meant by protected sex. Boys knew more about the modes of HIV transmission than girls. However, when they became sexually experienced, they were more likely to engage in high risk behaviours than girls. In contrast to high levels of faithfulness among girls, boys were more likely to have sex with two or more partners. A similar pattern was found in earlier studies in Nigeria and Brazil (10, 20). This is one of the reasons for the higher number of sexual partners among boys than among girls. In our study, more boys than girls reported having sex with multiple lifetime partners, and boys reported a higher number of sexual partners in the last 12 months than girls. Despite boys' greater involvement with multiple sexual partners, less boys than girls reported condom use during last sexual encounter. Faithfulness becomes effective in protecting against STDs only when the sexual partner is free from STDs (25). Therefore, it is important to encourage girls not only to be faithful but also to use condoms even when they have sex with their only sexual partner. Education on faithfulness and condom use among boys also needs to be intensified in order to enable them protect themselves and their sexual partners.

Why did boys engage in more sexual risk behaviours than girls when they were more knowledgeable about STDs? Lack of skills to negotiate safer sexual practices may be a

barrier in putting knowledge of sexuality into practice among girls. However, the difficulties that boys face in putting knowledge into practice are still poorly understood. Further research is needed to answer this question.

4.3 Association of knowledge and attitudes with practices

In regard to sexual activities in the last 12 months, factors found to be associated with having sex and having multiple sexual partners differed from boys to girls. On the other hand, our study found that knowledge and attitudes regarding STD prevention seem not to influence sexual behaviours among either boys or girls.

STD-related knowledge score contributed slightly to a decreased likelihood of having multiple sexual partners in the last 12 months among girls. The low level of awareness of STDs among these school pupils can explain this. Boys who could not identify their level of risk of contracting HIV/AIDS were less likely to report having sex in the last 12 months than those who considered themselves at great risk. Using a cross-sectional study, we can conclude only that there is an association between self-perceived risks of contracting HIV/AIDS and having sex in the last 12 months. However, we cannot say that the association is a causal relationship. Interestingly, boys who would not accept having sex without using a condom were more likely to have sex than others. We do not know the reason for this phenomenon. However, if these boys actually insist on using condoms in practice, it is a good sign for the fight against STDs.

In addition to knowledge and attitudes regarding STD prevention, other factors associated with sexual activities among school pupils must be considered. Age influenced having sex in the last 12 months among both boys and girls. This might be explained by the increased sexual desire of human beings as they mature. Applying this conclusion to interventions,

being faithful to one sexual partner and correct and consistent use of condoms should be emphasized in interventions targeted at late adolescents.

Adolescents often engage in unsafe sex, which may lead to STDs and unwanted pregnancy, thus interrupting education. It is said that delayed sex will enable adolescents to achieve higher education. However, the 2004 national survey of adolescents showed that only 6% of Ghanaian boys and 7% of girls reported avoiding sex in order to obtain better education (5). This means that school pupils have yet to understand the effects of delayed sex on educational achievement. In our study, schoolgirls who wished to attain an education beyond senior secondary school were more likely to report having sex in the last 12 months than others. We cannot explain this phenomenon. This finding suggests a need to inform school pupils, especially schoolgirls, about the possible negative impact of early sex on education and future living standards. This is equally important for both sexually inexperienced and sexually experienced girls. Sexually experienced girls need to be encouraged to stop having sex, or to have protected sex, in order to prevent STDs and pregnancy, and so ensure the fulfillment of their educational aspirations.

Christian boys were less likely to be involved in multiple sexual partnerships in the last 12 months than non-Christian boys. This was not apparent among girls because of the low percentage of girls reporting multiple sexual partners. The study found that girls living with only biological mother were less likely to have sex in the last 12 months than those living with both parents. This is contrary to our assumption that school pupils living with both parents are less likely to be involved in sexual risk behaviours than others.

4.4 Strengths and limitations

A main strength of the original survey was its choice of an appropriate data-collection time, as indicated by the very high number of participants in the survey. This research report's analysis of the quantitative data provided by the original survey demonstrated differences in knowledge, attitudes, and practices regarding STD prevention among boys and girls – information useful in the development of new interventions. The findings also suggest possibilities for more in-depth studies, such as qualitative studies designed to identify reasons for the differences discussed in this study.

However, this research report could not avoid the following limitations:

- The questionnaire consisted of closed-ended questions, drastically limiting exploration of school pupils' knowledge, attitudes, and practices regarding STD prevention.
- This study used secondary data from a survey on general sexual and reproductive health, and therefore lacked data on important aspects of STD prevention such as consistency of condom use, correct use of condoms, concurrent sexual partners, and same-sex partners.
- The study used a self-administered questionnaire, which included questions with multiple-choice answers; it was, therefore, prone to information bias, since respondents had only the given answers to choose from. They might give answers based on their guess work from the given answers.
- Sexual and reproductive health is a sensitive topic, and respondents might have been reluctant to disclose their sexual experiences (creating the possibility of further information bias).

- Some questions on sexual experiences called for respondents to remember what happened in the past, creating the possibility of recall bias.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the secondary data analysis of a survey on sexual and reproductive health among junior secondary school pupils in the Kassena-Nankana district, the following main findings have been identified:

- Eleven percent of junior secondary school pupils in the Kassena-Nankana district consistently and logically reported already having had sex, yet overall the school pupils demonstrated a low level of awareness of STD prevention.
- There are sex differences in knowledge, attitudes, and practices regarding STD prevention among school pupils: boys demonstrated a higher level of awareness of STD prevention than girls but tended to ignore practices of the 'ABC' approaches to STD prevention. Differences were observed in the association of knowledge and attitudes regarding STD prevention with sexual activities among both boys and girls.
- The classroom could be an avenue to bring STD-prevention education to school pupils. However, current school-based sex education programmes do not cover several important topics, and do not take sex differences into account.

5.2 Recommendations

5.2.1 For the current school-based intervention programme

Findings from this research report support the need for school-based sex education in junior secondary schools. These programmes need to be improved to cover comprehensive topics including both knowledge and skills. At school, lessons on sexual and reproductive health, including STDs, may be provided for pupils through in-class and out-of-class activities. Basic information for both sexes can be taught through in-class lessons to

enhance knowledge, attitudes, and practices regarding STD prevention among school pupils. However, sex-specific programmes implemented in out-of-class activities would be useful in compensating for sex differences in knowledge.

For girls, we need to:

- organize talks about sexual and reproductive health issues, including STDs;
- advise them on condom use even when they are faithful to one sexual partner;
- equip them with the skills necessary to negotiate safe sex with their sexual partners;
- emphasize the negative impact of early sex on education; in particular, sexually experienced girls should be encouraged to stop having sex, or to have protected sex, in order to enjoy better education.

For boys, we need to:

- discuss with them the benefits of delaying the onset of sexual debut and encourage them to do so;
- explain to them the value of faithfulness to one sexual partner;
- equip them with the life skills that will enable them to put knowledge into practice.

For school-based sex education programmes to be effective, supportive policies must be implemented. In particular, policy makers must consider how to increase accessibility of both male and female condoms for adolescents.

5.2.2 For subsequent research

This research report investigated penile-vaginal intercourse, which is the most common sexual activity. However, young people engage in other types of heterosexual and

homosexual activities, which put them at higher risk of contracting STDs. These sexual activities need to be explored in future studies.

It is find that many boys seemed not to be able to put their knowledge of STD prevention into practice in order to protect themselves. Obstacles need to be investigated in future studies in order to enable programmers to find solutions and incorporate these into intervention programmes. In addition to quantitative studies, qualitative studies should also be conducted in order to explore the underlying reasons for the sex differences discussed in this study.

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APPENDIX A

Questionnaire of the original survey

Note: An asterisk (*) was used to mark questions selected for this research report.

NAVRONGO HEALTH RESEARCH CENTRE
ADOLESCENT SEXUAL AND REPRODUCTIVE HEALTH PROJECT
SURVEY OF JUNIOR SECONDARY SCHOOL PUPILS - 2005

QUESTIONNAIRE

IDENTIFICATION							
NAME OF SCHOOL:							FMS001
NAME OF COMMUNITY:							FMS002
DATE OF INTERVIEW:							FMS003
CODE OF INTERVIEWER:							FMS004

SECTION 1: RESPONDENT'S BACKGROUND INSTRUCTIONS: Please circle only one answer per question		
NO	**QUESTIONS AND FILTERS**	**SKIP TO**
101*	SEX OF PUPIL 1. MALE 2. FEMALE	FMS101
102*	CLASS/FORM 1. JSS1 2. JSS2 3. JSS3	FMS102
103*	How old are you? Age ..... ☐☐	FMS103
104*	What religious denomination do you belong to? 1. CATHOLIC 2. BIBLE CHURCH OF AFRICA 3. CHRIST APOSTOLIC CHURCH 4. ANGLICAN 5. PENTECOSTAL 6. OTHER CHRISTIAN 7. MOSLEM 8. TRADITIONAL 9. NO RELIGION	FMS104
105*	Do you live with your biological mother in the same house? 1. YES 2. NO 3. MOTHER NO LONGER ALIVE	FMS105
106*	Do you live with your biological father in the same house? 1. YES 2. NO 3. FATHER NO LONGER ALIVE	FMS106
107*	What is the highest level of school you will like to complete? 1. JUNIOR SEC. /JSS 2. SENIOR SEC./SSS 3. ABOVE SSS 4. DON'T KNOW/UNSURE	FMS107
108*	Do you belong to any club in school? 1. YES 2. NO	FMS108

SECTION 2: REPRODUCTIVE HEALTH INFORMATION AND KNOWLEDGE INSTRUCTIONS: Please circle only one answer per question.		
NO	**QUESTIONS AND FILTERS**	**SKIP TO**
201	In the past year have you attended a lesson in school on the Menstrual cycle? 1. YES 2. NO	FMS201
202	In the past year have you attended a lesson in school on how pregnancy occurs? 1. YES 2. NO	FMS202
203	In the past year have you attended a lesson in school on contraception/ how to prevent pregnancy? 1. YES 2. NO	FMS203
204*	In the past year have you attended a lesson in school on sexually transmitted diseases? 1. YES 2. NO	FMS204
205*	In the past year have you attended a lesson in school on how to say 'NO' to sex? 1. YES 2. NO	FMS205
206	In the past year have you attended a lesson in school on personal hygiene? 1. YES 2. NO	FMS206
207*	In the past year have you attended a lesson in school on HIV/AIDS? 1. YES 2. NO	FMS207
208*	In the past year have you attended a lesson in school on abstinence? 1. YES 2. NO	FMS208
209	Teaching sex education in school is important because? 1. IT MAKES CHILDREN SEXUALLY ACTIVE 2. IT COULD LEAD TO EARLY MARRIAGE 3. IT CREATES CURIOSITY AMONG CHILDREN 4. IT TEACHES CHILDREN THE DANGERS OF EARLY SEX	FMS209
210	What do we call the transition between childhood and adulthood? 1. OUTDOORING 2. ADOLESCENCE 3. PUBERTY 4. CONFIRMATION	FMS210

NO	QUESTIONS AND FILTERS	SKIP TO
211	Which of the following is a reproductive part of a man? 1. OVARIES 2. PENIS 3. UTERUS 4. CLITORIS 5. DON'T KNOW	FMS211
212	Which of the following is a reproductive part of a woman? 1. SCROTUM 2. PENIS 3. VAGINA 4. TESTIS 5. DON'T KNOW	FMS212
213*	What is unprotected sex? 1. SEX WITHOUT THE USE OF CONDOM 2. NOT HAVING SEX AT ALL 3. USING CONDOMS 4. DON'T KNOW	FMS213
214*	If a person has an STD and it is not treated immediately, what can happen? 1. THE PERSON MAY GIVE BIRTH TO TWINS 2. THE PERSON MAY NOT BE ABLE TO GIVE BIRTH (INFERTILE) 3. THE PERSON MAY BE COUGHING ALL THE TIME 4. DON'T KNOW	FMS214
215	During which time of the monthly cycle does a woman have the greatest chance of becoming pregnant? 1. RIGHT BEFORE HER PERIOD STARTS 2. DURING HER PERIOD 3. RIGHT AFTER HER PERIOD HAS ENDED 4. ABOUT HALFWAY BETWEEN HER PERIOD 5. ANY TIME DURING THE MONTH 6. DON'T KNOW/UNSURE	FMS215
216	Can a girl/woman get pregnant the very first time that she has sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS216
217*	Can you get HIV/AIDS if you are given an injection with an unsterilised needle? 1. YES 2. NO 3. DON'T KNOW	FMS217

NO	QUESTIONS AND FILTERS	SKIP TO
218*	Can you get HIV/AIDS if you receive blood transfusion with blood that is infected with HIV/AIDS? 1. YES 2. NO 3. DON'T KNOW	FMS218
219*	Can you get HIV/AIDS if you shake hands with someone who has HIV/AIDS? 1. YES 2. NO 3. DON'T KNOW	FMS219
220*	Can you get HIV/AIDS if you have unprotected sex with an infected person (Somebody who has HIV/AIDS)? 1. YES 2. NO 3. DON'T KNOW	FMS220
221*	Can you protect yourself from getting HIV/AIDS if you do not have sex at all? 1. YES 2. NO 3. DON'T KNOW	FMS221
222*	Can you protect yourself from getting HIV/AIDS if you keep only one sexual partner who is not infected and who has no other partners? 1. YES 2. NO 3. DON'T KNOW	FMS222
223*	Can you protect yourself from getting HIV/AIDS if you always use a condom whenever you have sex? 1. YES 2. NO 3. DON'T KNOW	FMS223
224*	Can you protect yourself from getting HIV/AIDS if you or your partner takes contraceptive pills whenever you have sex? 1. YES 2. NO 3. DON'T KNOW	FMS224

NO	QUESTIONS AND FILTERS	SKIP TO
Instructions for Questions 225 to 230: please circle all answers you think are right for each question		
225	Which of the following changes take place in boys as they grow into men? 1. BROADENING OF CHEST 2. MENSTRUATION 3. GROWTH OF TESTIS AND PENIS 4. DEVELOPMENT OF BREASTS	FMS225A FMS225B FMS225C FMS225D
226	Which of the following changes take place in girls as they grow into women? 1. BROADENING OF CHEST 2. MENSTRUATION 3. GROWTH OF TESTIS AND PENIS 4. DEVELOPMENT OF BREASTS	FMS226A FMS226B FMS226C FMS226D
227*	What are some of the good things in delaying sex till later in life? 1. CAN ENJOY BETTER EDUCATION 2. WOULD NOT BE INFECTED WITH ANY DISEASE 3. WOULD PREVENT EARLY PREGNANCY 4. PEOPLE WHO HAVE EARLY SEX WOULD NOT GROW	FMS227A FMS227B FMS227C FMS227D
228*	What are some of the diseases that people can get from having sex? 1. SYPHILIS 2. GONORRHOEA 3. HIV/AIDS 4. GENITAL WARTS 5. HEPATITIS B 6. MALARIA	FMS228A FMS228B FMS228C FMS228D FMS228E FMS228F
229*	What signs and symptoms suggest that a person has an STD? 1. ITCHING IN PRIVATE PARTS 2. ULCER/SORES ON PRIVATE PARTS 3. LOWER ABDOMINAL PAIN 4. ABNORMAL VAGINAL DISCHARGE 5. COUGHING CONTINUOUSLY	FMS229A FMS229B FMS229C FMS229D FMS229E
230	What can a person do or use to avoid pregnancy? 1. NOT HAVING SEX 2. USE CONDOMS 3. USE INJECTABLE 4. PRAY TO GOD 5. TAKING CONTRACEPTIVE PILLS EVERY DAY 6. NOTHING 7. DON'T KNOW/UNSURE	FMS230A FMS230B FMS230C FMS230D FMS230E FMS230F FMS230G

SECTION 3: SEXUAL AND REPRODUCTIVE HEALTH ATTITUDES INSTRUCTIONS: Please circle only one answer per question		
NO	**QUESTIONS AND FILTERS**	**SKIP TO**
301*	Do you think your chances of getting HIV/AIDS are small, moderate, great or you have no chance of getting HIV/AIDS? 1. SMALL 2. MODERATE 3. GREAT 4. NO RISK AT ALL 5. DON'T KNOW/UNSURE	FMS301
302	Can a boy of your age refuse to have sex with a girl/woman who has given him a gift and asks him for sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS302
303	Can a girl of your age refuse to have sex with a boy/man who has given her a gift and asks her for sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS303
304	Is it right for a boy to force a girl to have sex if he loves her? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS304
305	Should girls remain virgins until they marry? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS305
306	Should boys remain virgins until they marry? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS306
307	Is it right for a boy to beat his girlfriend? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS307
308*	Are you confident that you can insist on use of condom every time you have sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS308

NO	QUESTIONS AND FILTERS	SKIP TO
309	Are you confident that you can refuse to have sex if you do not want to have sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS309
310*	Would you accept to have sex with someone who is not prepared to use a condom? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS310
311	Do you believe that most of your friends have had sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS311
312*	Do you think that teaching young people of your age about condoms encourages them to have sex? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS312
313*	Can a healthy looking person have the HIV/AIDS virus? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS313
314	Can a girl get pregnant if she has sex standing up? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS314

SECTION 4: SEXUAL AND REPRODUCTIVE HEALTH PRACTICES INSTRUCTIONS: Please circle only one answer per question		
NO	**QUESTIONS AND FILTERS**	**SKIP TO**
401	In the past twelve months, have you forced someone to have sex with you when the person did not want to? 1. YES 2. NO	FMS401
402	In the past twelve months, has anyone forced you to have sex when you did not want to? 1. YES 2. NO	FMS402
403*	How old were you when you had sex for the first time? AGE IN YEARS ..... ☐☐ NEVER HAD SEX .....96 DON'T KNOW/UNSURE 99	FMS403
404*	The first time you had sex what did you do to prevent pregnancy? 1. USED CONDOM 2. DID NOTHING 3. ORAL CONTRACEPTIVES 4. INJECTABLE 5. RHYTHM 6. NEVER HAD SEX	FMS404
405*	The first time you had sex what did you do to prevent sexually transmitted diseases (STDs)? 1. USED CONDOM 2. DID NOTHING 3. NEVER HAD SEX	FMS405
406*	How many different people have you had sex with in the last twelve months? NUMBER OF PEOPLE ..... ☐☐ NEVER HAD SEX 96	FMS406
407*	How many different people have you ever had sex with in your life? NUMBER OF PEOPLE ..... ☐☐ NEVER HAD SEX 96	FMS407
408*	The last time you had sex did you or your partner use a condom? 1. YES 2. NO 3. NEVER HAD SEX	FMS408

NO	QUESTIONS AND FILTERS	SKIP TO
409*	**[For Boys]:** Have you ever made a girl pregnant? **[For Girls]:** Have you ever been pregnant? 1. YES 2. NO	FMS409
410	Do you intend to have sex in the next twelve months? 1. YES 2. NO 3. DON'T KNOW/UNSURE	FMS410
411	What is the best age for a boy to have sex for the first time? AGE IN YEARS..... ☐☐ DON'T KNOW/UNSURE 99	FMS411
412	What is the best age for a girl to have sex for the first time? AGE IN YEARS..... ☐☐ DON'T KNOW/UNSURE 99	FMS412
413	From whom do you get the greatest pressure to have sex? 1. NO PRESSURE TO HAVE SEX 2. FRIENDS OF SAME SEX 3. FRIENDS OF OPPOSITE SEX 4. PARENTS 5. OTHER RELATIVES 6. PARTNER/SPECIAL FRIEND 7. SCHOOL MATES 8. TEACHERS 9. RELIGIOUS LEADER	FMS413
414	From whom do you get the greatest encouragement/support to abstain from sex? 1. NO ENCOURAGEMENT FROM ANYBODY 2. FRIENDS OF SAME SEX 3. FRIENDS OF OPPOSITE SEX 4. PARENTS 5. OTHER RELATIVES 6. PARTNER/SPECIAL FRIEND 7. SCHOOL MATES 8. TEACHERS 9. RELIGIOUS LEADERS	FMS414

NO	QUESTIONS AND FILTERS	SKIP TO
415*	In the past twelve months did you receive any information on STDs including HIV/AIDS from a health worker? 1. YES 2. NO	FMS415
416	In the past twelve months, did you receive any information on pregnancy related issues from a health worker? 1. YES 2. NO	FMS416

THANK YOU VERY MUCH FOR TAKING TIME TO ANSWER THESE QUESTIONS. WE APPRECIATE YOUR SUPPORT AND PARTICIPATION IN THIS SURVEY!

APPENDIX B

Informed consents of the original survey

NAVRONGO HEALTH RESEARCH CENTRE IN-SCHOOL BASELINE SURVEY-2005
HEADMASTER/HEADMISTRESS CONSENT FOR PUPILS

Hello! My name is_____ and I work with the Navrongo Health Research Centre. We are conducting a survey about young people's knowledge of sexual and reproductive health issues, the sexual behaviours that put them at risk for unwanted pregnancy and/or sexually transmitted diseases, and the ways young people protect themselves from these risks. This information is intended to help us provide better health information and services for young people in the district.

I would like to ask your permission for pupils of (NAME OF SCHOOL) to participate in the survey. Their participation is entirely voluntary. If you agree for them to take part in the survey, they would be given questionnaires to complete on their own. The questions ask them about their personal lives. I will read and explain the questions for them to answer.

The participation of pupils from this school in the survey is entirely voluntary. You can choose not to allow them to take part in the survey. If you agree for them to take part, individual pupils are free to withdraw at any point, and this will not affect them in any way.

All information collected from this study will be kept strictly confidential and will not be shown to anyone. We will not release any information about your school or the pupils to anyone.

If you will like to find out more about the survey, you may contact any of the following persons at the Navrongo Health Research Center.

Dr. Abraham Hodgson, Dr. Cornelius Debpuur and Dr. John Williams
P.O.Box 114, Navrongo.
Tel: 0244577665, 074222380.

If you agree that pupils from your school can participate in the study, please sign below to show that you have consented voluntarily.

Signature of Headmaster/Mistress: _____ Date: | | | | | | |

Signature of Investigator: _____ Date: | | | | | | |

HEADMASTER/MISTRESS AGREES…..1
PUPILS CAN BE INTERVIEWED ↓

HEADMASTER DOES NOT AGREE…..2
PUPILS CAN BE INTERVIEWED ↓

NAVRONGO HEALTH RESEARCH CENTRE IN-SCHOOL BASELINE SURVEY-2005
CONSENT FOR PUPILS

Hello! My name is_____ and I work with the Navrongo Health Research Centre. We are conducting a survey about young people's knowledge of sexual and reproductive health issues, the sexual behaviours that put them at risk for unwanted pregnancy and/or sexually transmitted diseases, and the ways young people protect themselves from these risks. This information is intended to help us provide better health information and services for young people in the district.

I would like to ask you to take part in the survey. If you agree to take part in the survey, you would be given a questionnaire that you are required to complete on your own. The questionnaire has questions about your personal life. You may find some of the questions embarrassing, but I will like you to answer all the questions truthfully. I will read and explain the questions for you to answer.

Your participation is entirely voluntary. You can choose not to take part in the survey. If you agree to take part, you are free to withdraw at any point, and this will not affect you in any way.

All information collected from this study will be kept strictly confidential and will not be shown to anyone. We will not release any information about you to anyone.

If you will like to find out more about the survey, you may contact any of the following persons at the Navrongo Health Research Center.

Dr. Abraham Hodgson, Dr. Cornelius Debpuur and Dr. John Williams
P.O.Box 114, Navrongo.
Tel: 0244577665, 074222380

If you agree to participate in the survey, please sign or write your name in the space below to show that you understand the information above and that your consent is given voluntarily.

Signature of Pupil: _____ Date: | | | | | | |

Signature of Investigator: _____ Date: | | | | | | |

PUPIL AGREES TO BE INTERVIEWED ….1 ↓

PUPIL DOES NOT AGREE TO BE INTERVIEWED….2 ↓

APPENDIX C

Ethical approval letters for the original survey

INSTITUTIONAL REVIEW BOARD
NAVRONGO HEALTH RESEARCH CENTRE, MINISTRY OF HEALTH
P. O. BOX 114, NAVRONGO UER, GHANA
Tel: 233 - 742 22380 Fax: 233 742 22320
Email: eagongo@navrongo.mimcom.net

19th October 2002

Dr. Cornelius Debpuur
Navrongo Health Research Centre
Navrongo

Dear Dr. Debpuur

Approval letter: "Promoting Healthy Sexual and Reproductive Health Among Adolescents in the Kassena-Nankana District of Ghana"

On October 19th 2002, the Navrongo Health Research Centre Institutional Review Board reviewed your protocol "Promoting Healthy Sexual and Reproductive Health among Adolescents in the Kassena-Nankana District of Ghana" and gave full approval for the commencement of the project.

The Board is of the opinion that the proposed study will benefit research and the community in general. Also, it does not pose any major ethical problems in terms of the safety and welfare of study participants. The Board however recommends that you submit consent forms to be used in the first phase of the study as well as any further changes you might make in the course of the study.

You are reminded to report all serious adverse events related to this study to the NHRC-IRB within three working days verbally, and within one week in writing. You will also be reminded when your protocol is due for continuing review.

If you have any questions, please contact Ms. Paulina Tindana or Mr. Raymond Aborigo, the IRB administrators, at the Navrongo Health Research Centre.

We wish you all the best in this study.

Sincerely,

NHRC INST. REVIEW BOARD
CERTIFICATION
Date .....

Dr. Erasmus E. A Agongo
Chair, NHRC-IRB

In case of reply the number and date of this letter should be quoted.

My Ref. HRU/Ethics/
Your Ref. No:

REPUBLIC OF GHANA

Health Research Unit
Ghana Health Service
P. O. Box 184
Accra
Tel: +233-21-230220
Fax + 233-21-226739

Email: John.Gyapong@hru-moh.org

16th September 2002

Dr Cornelius Debpuur
Navrongo Health Research Centre
P O Box 114
Navrongo

Dear Sir,

Promoting Healthy Sexual and Reproductive Health among Adolescents in the Kassena Nankana District of Ghana

The above-mentioned proposal has been reviewed. The proposal was found to be of high scientific merit and very relevant for programme purposes in the Ghana Health Service of the Ministry of Health.

No major ethical issues of concern were found. Issues relating to informed consent of participants will however have to be addressed during the implementation of the study.

Please endeavour to update us on the progress of the study for policy purposes.

The study team is therefore given permission to carry out the study.

Yours sincerely,

Dr John Gyapong
Director

GHANA EDUCATION SERVICE

In case of reply, the number and date of this letter should be quoted.

Our Ref NED/ GES/KND/571/
Your Ref

REPUBLIC OF GHANA

KASSENA-NANKANA DISTRICT
EDUCATION OFFICE
P.O. BOX 56
NAVRONGO

16th November, 2005.

PERMISSION TO CONDUCT A SURVEY AMONG JSS STUDENTS

This is to inform you that your request on the above issue has been granted with effect from 17th November, 2005 since the exercise would benefit our students and the entire district.

I wish you the best of luck in your endeavours.

ACHANA J. RAYMOND
DISTRICT DIRECTOR

DR. CORNELIUS DEBPUUR,
NAVRONGO HEALTH RESEARCH CENTRE,
NAVRONGO.

cAc/*

APPENDIX D

Ethical approval letters for the research report

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Duong

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M060913**
PROJECT	Sexually Transmitted Disease Preventions: Knowledge, Attitudes, & Practices among school Pupils in....
INVESTIGATORS	Dr LQ Duong
DEPARTMENT	School of Public Health
DATE CONSIDERED	06.09.29
DECISION OF THE COMMITTEE*	APPROVED UNCONDITONALLY

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 06.10.23 **CHAIRPERSON** .....
(Professors PE Cleaton-Jones, A Dhai, M Vorster, C Feldman, A Woodiwiss)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr K Kahn

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Le Quyen Duong (Jan 11, 2007)

In case of reply the number and date of this letter should be quoted.

My Ref. :
Your Ref. No.

Institutional Review Board
Navrongo Health Research Centre
Ghana Health Service
P. O. Box 114
Navrongo, Ghana
Tel: +233-742-22310/80
Fax + 233-742-22320
Email: irb@navrongo.mimcom.net

15th January 2007

Dr. Le Quyen Duong
Navrongo Health Research Centre
Navrongo

Dear Le Quyen,

Ethical Clearance NHRCIRB059

Project Title: "Sexually Transmitted Disease Prevention: Knowledge, Attitudes, and Practices among School Pupils in Rural Ghana"

I write to inform you that the Navrongo Health Research Centre Institutional Review Board (NHRCIRB) has approved your proposal, which was submitted for ethics review in December 2006.

The NHRCIRB has determined that the above proposal meets the criteria for exempt review and does not require further review by the IRB, since it involves the study of existing data, and will be recorded in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. 45 CFR 46 (b).

If you have any further questions, please contact Ms. Paulina Tindana or Mr. Thompson Apempale, the IRB Administrators of the NHRC IRB.

Sincerely,

Dr. Joseph Amankwa
(Chair, NHRC IRB)

THE CHAIR
Navrongo Health Research Centre
Institutional Review Board
BOX 114, NAVRONGO

CC: Director-NHRC