## Supplementary Material 3: Key survey measures

**Table 1: Key survey measures**

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| **Measure** | **Purpose** | **Question** | **Responses** | **Source** | **Variable** |
| Self-reported pregnancy | Secondary outcome | Have you ever been pregnant? | Yes, in the past  Yes, I am now  No, never  Prefer not to say | RIPPLE1 measure | Binary |
| Unintended pregnancy | Secondary outcome | Think about your most recent pregnancy. Did you mean to get pregnant? | Yes  No  Not sure  Prefer not to say | Adapted RIPPLE1 measure | Binary |
| Initiation of pregnancy for boys | Secondary outcome | Have you ever got someone pregnant? | Yes  No  Not sure  Prefer not to say | Adapted RIPPLE1 measure | Binary |
| Sexually transmitted infections | Secondary outcome | Have you ever been told by a doctor or nurse that you had any of the following sexually transmitted infections: chlamydia, genital warts, genital herpes or gonorrhoea? | Yes  No  Not sure  Prefer not to say | Adapted RIPPLE1 measure | Binary |
| Age of sexual debut (heterosexual vaginal sex) | Secondary outcome | If you have had vaginal sex once, please enter how old you were when you had vaginal sex. | Free text | Adapted RIPPLE1 measure | Continuous |
| If you have had vaginal sex more than once, please enter how old you were the first time you had vaginal sex. |
| Number of sexual partners | Secondary outcome | About how many different people have you ever had vaginal sex with? | Free text | Adapted RIPPLE1 measure | Continuous |
| Use of contraception at first sex | Secondary outcome | When you had vaginal sex, did you or your partner use any of the following? | Condom  The pill  The emergency contraception pill ('morning after' pill)  Contraception injection / implant  Other protection  Not sure  Didn't use anything  Prefer not to say | Adapted RIPPLE1 measure | Binary |
| Use of contraception at last sex | Secondary outcome | The last timeyou had vaginal sex, did you or your partner use any of the following? | Condom  The pill  The emergency contraception pill ('morning after' pill)  Contraception injection / implant  Other protection  Not sure  Didn't use anything  Prefer not to say | Adapted RIPPLE1 measure | Binary |
| Non-volitional sex | Secondary outcome | In the last 12 months (so, since June 2018) has **anyone forced you to have sex?** | Never  Rarely  Sometimes  Often  Prefer not to say | Adapted Conflicts in Adolescent Dating Relationships Inventory measure2 | Binary ever versus never |
| Social norms supportive of positive relationships and sexual health | Mediator | Most of my friends believe that people who have sex when they are younger often  regret it when they are older | The following questions ask about your friends and what they think. Try your best to answer the questions, but if you’re not sure of the answer, please tick the ‘I am not sure’ option.  Please 🗸one box on every line  Definitely yes  Probably yes  Probably no  Definitely no  I am not sure | Safer Choices3 | Continuous with score per item from 0 for least supportive response to 3 for most supportive, summed across items |
| Most of my friends believe  that people should discuss with their partner when is the right time for them to start  having sex |
| Most of my friends believe that people in a relationship can enjoy each other’s bodies without having sex |
| Most of my friends believe it is okay to accept money or gifts in return for sex |
| Most of my friends believe that using condoms interrupts sexual fun |
| Most of my friends believe that having sex is the only way to be satisfied in a sexual  relationship |
| Most of my friends believe that you don’t need to use condoms for sex if you now the other  person very well |
| Most of my friends believe it is okay for a girl to carry condoms |
| Most of my friends believe that using a condom would reduce sexual enjoyment |
| Most of my friends believe it is the man’s responsibility to carry condoms |
| Most of my friends believe that you don’t need to have sex to show someone  you love them |
| Most of my friends believe  people should be free to choose to have sexual relationships with people of the same sex |
| Most of my friends believe it is a girl’s responsibility to think about contraception  (birth control) |
| Most of my friends believe  that a man should decide the right time to start having  sex |
| Perceived behavioural norms about early sexual experience and low use of condoms and contraception | Mediator | In your school about how many students your age do you think have had sexual intercourse? Even if you are not sure please tick the option that you think is right. | Please 🗸one box only  None of them  A few of them  About half of them  Most of them  Almost all of them | Safer Choices3 | Continuous with score per item from 0 for most risky norm to 4 for most supportive, summed across items |
| Of those students your age who have had sexual intercourse, how many of them do you think use condoms most of the time? |
| Of those students your age who have had sexual intercourse, how many of them do you think use contraception most of the time? |
| Sexual health knowledge | Mediator | A girl can get pregnant the first time she has sex with a boy | Are the following statements true or false?  Please 🗸 one box per statement  True  False  Don’t know | Adapted SHARE4 items | Continuous with score comprising 1 point for each correct answer |
| Oral sex tends to be less risky for catching STIs (sexually transmitted infections) than sexual intercourse |
| All infections caught from having sex can be cured with medical treatment |
| If someone has an STI (sexually transmitted infection), they may not show any sign of it at all |
| If a girl under 16 tells a doctor she may be pregnant, legally the doctor must inform her parents |
| A girl can get pregnant if she has sex standing up with a boy |
| A girl cannot get pregnant if the boy withdraws his penis from her vagina before ejaculation /coming |
| Wearing two condoms is better protection against STIs and unplanned pregnancy than wearing one condom |
| Young people under 16 can get free access to condoms and contraception from a sexual health clinic without their parents knowing |
| The IUD (copper coil) can be used as emergency contraception if inserted up to five days after having sex |
| If you need to use emergency contraception (‘the morning after pill’) to prevent pregnancy, it is most effective | Please 🗸 one box only  Within 12 hours of unprotected sex  Within 24 hours of unprotected sex  Within two days (48 hours) of unprotected sex  Within three days (72 hours) of unprotected sex  Within a week (168 hours) of unprotected sex  Don’t know |
| Sexual health and contraceptive skills and access | Mediator | Get a condom | How easy or difficult do you think it would be for you to do the following?  Very easy  Easy  Difficult  Very difficult | Adapted SHARE4 items | Continuous with score per item from 0 for very difficult to 3 for very easy, summed across items |
| Use a condom properly |
| Carry condoms when you go out |
| Choose a suitable method of contraception for yourself or help a partner to do so |
| Make an appointment at a clinic or with a doctor to test for STIs (sexually transmitted infections) |
| Discuss with a doctor or nurse you or your partner getting contraception |
| Discuss with a doctor or nurse getting tested for STIs |
| Sexual health service access | Mediator | Do you know where you could get medical advice from a trained health professional about contraception? | Please 🗸 one box only  No  Yes | Adapted SHARE4 items | Continuous with score for each yes |
| Do you know where you could get medical advice from a trained health professional about STIs (sexually transmitted infections)? |
| Do you know who you could speak to at your school if you were to experience unwanted sexual touching or sexual abuse? |
| Do you know who you could speak to at your school if you were to experience sexual harassment from another pupil?  (Sexual harassment is unwanted and unwelcome sexual touching or sexual talk. Sexual harassment does not nclude *behaviours* that you like or want, for example, wanted kissing, touching, or flirting) |
| Do you know who you could speak to at your school about contraception and sexual health? |
| Sexual communication self-efficacy | Mediator | Ask your partner how  many sexual partners they have had in the past | In a sexual relationship with another person now or in the future, how easy or difficult do you think it would be for you to:  Please 🗸 one box on every line  Very easy  Easy  Difficult  Very difficult  I am not sure | Adapted SHARE4 items and Sexual Communication Self-Efficacy Scale4 | Continuous with score per item from 0 for very difficult to 3 for very easy, summed across items |
| Ask your partner if they are having sex with other people |
| Ask your partner if they have ever had an STI sexually transmitted infection) |
| Ask if a condom could be used for having sex |
| Insist that a condom be used for having sex |
| Refuse to have sex with your partner if they won’t use a condom |
| Tell your partner that a certain sexual activity hurts you |
| Tell your partner that a certain sexual activity makes you feel uncomfortable |
| Tell your partner that a certain sexual activity is not making you feel good |
| Suggest a new sexual activity (e.g. sexual position) |
| Tell your partner that you do not want to have sex |
| Tell your partner you would like to have sex more often |
| Tell your partner that a sexual activity feels good |
| Talk with your partner about how it feels to use a condom |
| Talk with your partner about how to put on a condom |
| Talk with your partner about whether a condom is on correctly |
| Tell your partner that you want to have sex |
| Tell your partner that you like a specific sexual activity |
| Initiate (start off) having sex  with your partner when you feel like it |
| Sexual competence | Mediator | When you had vaginal sex, did you or your partner use any of the following? | Condom  The pill  The emergency contraception pill ('morning after' pill)  Contraception injection / implant  Other protection  Not sure  Didn't use anything  Prefer not to say | Natsal6 | Continuous with score per item of 0 for non-competent responses and 1 for competent responses, summed across items |
| When you had vaginal sex, would you say you were both equally willing to have sex or was one of you more willing than the other? | Please 🗸 one box only  We were both equally willing  I was more willing  The other person was more willing |
| Looking back now to when you had vaginal sex, do you think | Please 🗸 one box only  You should have waited longer before having sex with anyone  That you shouldn’t have waited so long  It was at about the right time |
| Which one of these applied to you at the time you had vaginal sex (choose the main one that applied at the time) | Please 🗸 one box only  I was curious about what it would be like  I was carried away by my feelings  Most people in my age group seemed to be doing it  It seemed like a natural ‘follow on’ in the relationship  I was a bit drunk at the time  I had smoked some cannabis  I had taken some other drugs  I wanted to lose my virginity  I was in love  Can’t choose/more than one main factor |
| Communication with male carer | Mediator | If you have a dad or male carer you live with or see regularly, how do you find talking to him about personal things? | Please 🗸 one box only  Very easy  Quite easy  Quite difficult  Very difficult  I don’t have a dad or male carer I live with or see regularly | RIPPLE1 measure | Continuous with 0 for very difficult to 3 for very easy |
| Communication with female carer | Mediator | If you have a mum or female carer you live with or see regularly, how do you find talking to her about personal things? | Please 🗸 one box only  Very easy  Quite easy  Quite difficult  Very difficult  I don’t have a mum or female carer I live with or see regularly | RIPPLE1 measure | Continuous with 0 for very difficult to 3 for very easy |
| Engaging school climate | Mediator | The teachers at this school are fair in dealing with students | Please 🗸 one box on every line  Yes Totally agree  Yes, I agree a bit  No, I don’t really agree  No Totally disagree | Beyond Blue School Climate Questionnaire7 | Continuous with each item scored 0 for least positive answer to 3 for most positive answers, summed across items for subscales (10 for relationships, 8 for belonging, 4 for commitment, 6 for participation) and overall scale |
| There’s at least one teacher or other adult in this school I can talk to if I have a problem |
| I feel I can go to my teachers with the things that are on  my mind |
| In this school, teachers believe all students can learn |
| In this school, students’ ideas are listened to and valued |
| In this school, teachers and students really trust one another |
| In this school, teachers treat students with respect |
| This school really cares about students as individuals |
| Most of my teachers really listen to what I have to say |
| I really like most of my teachers at this school |
| I feel very different from most other students here |
| I can really be myself at this school |
| Other students in this school take my opinions seriously |
| I am encouraged to express my own views in my classes |
| Most of the students in my classes enjoy being together |
| Most of the students in my classes are kind and helpful |
| Most other students accept me as I am |
| I feel I belong at this school |
| I try hard in school |
| Doing well in school is important to me |
| Continuing or completing my education is important to me |
| I feel like I am successful in this school |
| There are lots of chances for students at this school to get involved in sports, clubs and other activities outside class |
| Teachers at this school notice when students are doing a good job and let them know about it |
| At this school, students have a lot of chances to help decide and plan school activities, events and policies |
| Student activities at this school offer something for everyone |
| Students have a say in decisions affecting them at this school |
| Students at this school are encouraged to take part in activities, programmes and special events |
| Career/educational aspirations | Mediator | Be in a steady job | How much do you agree with the following statements?  By the time I am 20 years old, I think I will:  Please 🗸 one box on every line  Definitely will  Probably will  Probably will not  Definitely will not | Adapted RIPPLE1 measure | Binary scored 1 if reports definitely or probably for any of the four outcomes. |
| Be in a job training scheme or apprenticeship |
| Be at university |
| Be at college studying for a trade or job |
| Family affluence scale | Covariate | Do any of the adults you live with (not including brothers and sisters or step-brothers and step-sisters) own a car or van? | No  Yes, one car or van  Yes, two or more cars or vans | Family affluence scale8 | Continuous with score per item from 0 for least affluent response to 1, 2 or 3 for mre affluent, summed across items |
| Do you have your own bedroom to yourself at home? | Yes  No |
| Do you have a dishwasher at home? |
| How many computers (including laptops and tablets, but not including game consoles and smartphones) do the family members you live with own? | None  One  Two  More than two |
| How many bathrooms (rooms with a bath/shower or both) are in your home? |
| Sex | Covariate | At birth, were you described as: | Please 🗸 one box only  Male  Female  Prefer not to say | New | Binary |
| Gender | Covariate | Which of the following best describes how you think of yourself *now*?  *(We ask this in addition to the question above because some people’s gender identity is not the same as what they were described as at birth).* | Please 🗸 one box only  Boy  Girl  Trans boy  Trans girl  Non-binary (neither male or female)  Other  Unsure / questioning  Prefer not to say | New | Categorical |
| Sexual identity | Covariate | Which of the following do you consider yourself to be? | Please 🗸 one box only  Straight or heterosexual (a girl who is attracted to boys or a boy who is attracted to girls)Gay or lesbian (a girl who is attracted to girls or a boy who is attracted to boys)  Bisexual (attracted to girls AND boys)  Other  Unsure/questioning  Prefer not to say | Adapted RIPPLE1 item | Categorical |
| Ethnicity | Covariate | Which of the following best describes your ethnic group or background? | Please 🗸 one box only  White British  Any other White background  Asian or Asian British  Black African, Caribbean or Black British  Mixed/multiple ethnic background  Any other ethnic group | ONS9 | Categorical |
| Family structure | Covariate | Which adult or adults (not including older brothers and sisters or step-brothers and step-sisters) do you normally live with? | Please 🗸 all that apply  My mum  My dad  My step-mum  My step-dad  My foster-mum  My foster-dad  Another adult | Adapted RIPPLE1 item1 | Categorical |

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