Y-Check: Evaluating the effectiveness of adolescent health check-ups

Analytical plan for Zimbabwe
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1. Introduction

Systematic reviews have identified individual interventions that are effective at improving various aspects of adolescent health, however, most adolescents only come in contact with health services when they are ill, and services are not always appropriate for their needs. This represents a missed opportunity for early detection of health problems, health promotion, and the development of health-seeking behaviours.

Identifying adolescents with risky conditions and behaviours or undiagnosed disability is important given (i) the growing number of adolescents (ii) the increasing proportion of the total burden of disease that occurs in adolescence and (iii) the fact that many key health conditions (e.g. mental health disorders) and behaviours (e.g. tobacco and alcohol use, unhealthy diet, low physical activity, risky sexual behaviours) that predispose to serious conditions in later life start in adolescence (iv) the negative impact of poor health on educational attainment.

Routine health check-up visits for adolescents which screen for multiple conditions and risk behaviours, could provide an entry point into services and be highly cost-effective, but there is little empirical evidence for their feasibility, acceptability and effectiveness. In low and middle income settings, preventative health services for adolescents are largely provided in schools, are usually limited to deworming and vaccination campaigns, and do not address other important conditions and risk factors such as nutrition, mental health, and disability. Obtaining evidence on check-ups is a top World Health Organization (WHO) priority for adolescent health research so that they can develop recommendations for preventive and promotive contacts with the health system for adolescents.

The Y-Check programme is addressing a critical gap in the field of adolescent health and will provide policy relevant evidence on check-up visits and the implementation of school health services. Y-Check is screening and treating/referring adolescents for common conditions

through health check-up visits in younger (10-14y) and older (15-19y) adolescents. Adolescents are only being screened for conditions that have an accurate and acceptable screening test and a locally accessible effective intervention e.g. mental health, HIV, vision and hearing impairments, anaemia.

1.1 Aim

To develop and implement a potentially sustainable adolescent health check-up programme in three African cities (Cape Coast, Ghana; Mwanza, Tanzania; Chitungwiza, Zimbabwe) and evaluate the acceptability, feasibility, short-term effectiveness, and cost-effectiveness of the programme to improve adolescents´ health and well-being.

1.2 Objectives

1. Year 1 (2022 Zimbabwe; 2023 Ghana & Tanzania): To further refine and pre-test a health and well-being check-up programme for adolescents using accurate and acceptable screening tests and provides locally-accessible effective interventions.

2. Year 2 (2022-24 Zimbabwe; 2023-24 Ghana & Tanzania): Through a prospective intervention study in selected schools and communities in Cape Coast Ghana, Mwanza Tanzania and Chitungwiza Zimbabwe to:
   i. Evaluate the implementation of the programme by measuring key implementation outcomes: acceptability, adoption, appropriateness, feasibility, fidelity, and cost.
   ii. Describe the programme context and mechanisms of action.
   iii. Estimate short-term programme impact on adolescent outcomes: health-related knowledge; intentions, agency, and perceived social support for behaviour change; engagement with health services; health-related behaviours; improvements in previously-diagnosed health and well-being conditions.
   iv. Estimate the short-term cost-effectiveness of the programme in reducing disease burden and improving adolescent well-being.
   v. Obtain information on key parameters needed for the planning of larger evaluation study that would take place in a subsequent Phase 3 of the Y-Check Research Programme: prevalence of health and well-being conditions and of health and well-being-related behaviours, acceptability of referral, feasibility of following-up programme participants, initial estimates of the impact of the programme on health, educational and well-being outcomes, and optimal implementation of the Y-Check intervention.

3. Year 3 (2024): To refine the Y-Check intervention and its theory of change; to finalise methods for the measurement of impact of the programme in Phase 3 of the Y-Check Research; and to disseminate the results of Phase 2.

1.3 Phase 2 study design

During **Year 2 (Implementation research)** we are conducting a prospective intervention study in Cape Coast Ghana, Mwanza Tanzania and Chitungwiza Zimbabwe to assess the feasibility of the intervention and to evaluate the short-term impact of the intervention. In each of the three cities, the intervention will be implemented for 10-14 year olds in up to 6 government primary schools (N=1000 per city, Y-Check 1), for 15-19 year olds in up to 8 secondary schools and for 16-19 year olds in up to 3 community venues (N=1000 per city, Y-Check 2). In

Zimbabwe, the aim was to recruit 50% of the older adolescents from schools and 50% at community venues.

The school-based service for 10-14 year olds is known as Service 1, the school-based service for 15-19 year olds is known as Service 2, and the community based service for 16-19 year olds is known as Service 3.

In this hybrid effectiveness-implementation study, both data on implementation process, and adolescent outcomes are being captured. A mixed-methods process evaluation will describe the programme implementation, context, and mechanisms of action. The study cohort participants are being followed for approximately 4 months, with adolescent process and outcome data collected at screening and 4-month follow-up visits. Where data are available, we will estimate the impact of the intervention on DALYs averted. This study will gather information to develop methodologies for a potential larger future study to measure the longer-term health, wellbeing and educational impact of the programme at the population level. We will assess the potential costs of scaling-up and financial sustainability of the programme.

This document describes the analysis of effectiveness and quantitative process outcomes. The methods and analysis of the qualitative process evaluation data and costing study will be described separately.

1.4 Data Management

The majority of data are collected digitally offline in ODK or a bespoke Android application on tablets. A small amount of data are collected on paper (referral forms, laboratory results etc.). The main sources of data are the evaluation questionnaire (baseline, 4 months), the Y-Check screening tool (baseline), the exit interview (baseline), laboratory results, oral health charts, and referral forms.

Additional data sources include registration books, field notes, nurses clinical notebooks, team debrief summaries, outputs from participatory activities, audio recordings of workshops and interviews.

The tablets are synchronized at the end of every day at BRTI offices. Paper forms are double-entered into ODK. Data cleaning involves checking of key variables for consistency across data sources (gender, date of birth, location, etc) and merging of data sets to create one wide data set. Data analysis will take place at both BRTI and LSHTM. Data entered whilst off-line on tablets, is synchronised over local THRU-ZIM wi-fi network and later downloaded from ODK Server to a Microsoft SQL Server and Microsoft Access is used as the frontend database with links to Microsoft Excel which is used for data compare of the double entered data. These systems have been programmed with quality control checks and conditional data validation. All data stored in the databases is backed up daily to a THRU-ZIM secure Synology network attached storage (NAS) drive.

All participants will be identified with a unique participant identification number (PID). At follow-up visits the following variables are used to confirm identity: PID, name, participant's or parent/guardian's phone number and home address, enrolment date, sex, date of birth, check-up location. Any cases of conflicting information will be investigated to determine whether they are data entry errors or identification errors (i.e. PID errors). PID errors will be corrected based on the other listed variables where possible. The number and proportion of unverifiable identification errors will be reported.

2 Primary outcome

The primary outcome is the proportion of participants screening positive for at least one condition who receive appropriate on-the-spot care or complete appropriate referral for all identified conditions by the time of the follow-up visit.

A client diagnosed with more than one condition must have had completed care or referral for each of those conditions to be included in the numerator for the primary outcome.

Tables 1 & 2 show the conditions, issues and behaviours screened for at baseline, and the primary outcome definition.

Each condition is ‘flagged’ if a problem is identified. For most conditions, the Y-Check nurse then either confirms the flag or records it as a ‘false flag’, i.e. not a condition. A flag leads to treatment and/or counselling on-site, or referral to an external provider, or both. Brief counselling could be provided by the Y-Check nurse (Nurse counselling) or the nurse could refer the participant to the Y-Check counsellor for a more comprehensive counselling session (Y-Check counselling).

If the participant is offered but refuses treatment or discussion of the issue then this is recorded.

Conditions which are measured but not flagged are not part of the primary outcome. The only condition which was measured but not flagged was fine motor skills, measured by finger tapping. This condition was not flagged as appropriate cut-offs for further action were not available.

Table 1: Conditions and issues incorporated in primary outcome, with their flags

Condition, issue or behaviour	Flag	Correct management		
		Everyone who is flagged	*Everyone who is flagged and not deemed a 'false flag' by the nurse*	*Only if indicated by nurse and/or counsellor*
Home (psychosocial)	Don't get along with the people I live with, OR has no one at home to talk to about problems	Nurse counselling or Y-Check counselling		Referral
School/work (psychosocial)	School/workplace is never safe, OR has no one at school/work I can talk to about problems OR reports school results are bad	Nurse counselling or Y-Check counselling		Referral
Body (psychosocial)	The look of my body makes me feel angry or sad, OR I don't think my weight is healthy	Nurse counselling or Y-Check counselling		Referral
Meals (psychosocial)	Missed dinner/supper more than once in past 2 weeks	Nurse counselling or Y-Check counselling		Referral
Friends (psychosocial)	Relationship with friends is bad, OR is bullied often/always	Nurse counselling or Y-Check counselling		Referral
Oral hygiene	Brushed teeth less than daily or without flouride toothpaste	Nurse counselling		
Sleep	Less than 8 hours sleep per night	Nurse counselling or Y-Check counselling		
Exercise	Number of days when physically active in past 2 weeks is 'once' or 'never'	Nurse counselling or Y-Check counselling		
Drugs/alcohol	CRAFFT score ≥2 OR CRAFFT score <2 & report have used alcohol or substances at least once in the past year	Nurse counselling or Y-Check counselling		Referral

Smoking	Smoked cigarettes or used another tobacco product or used a vaping product containing nicotine in the past 30 days	Nurse counselling or Y-Check counselling		Referral
Sexual risk	More than 2 sexual partners in last 6 months, OR uses condoms never/rarely/sometimes, OR is male and attracted to men (among those who report having had at least one sexual partner in the past 6 months)	Nurse counselling or Y-Check counselling		
Epilepsy	Ever has fits OR episodes when legs or arms have jerking movements or fall to the ground and lose consciousness		Referral	
BMI for age	Severe thinness (-3SD), thinness (-2SD), overweight (+1SD), obese (+2SD) https://www.who.int/tools/growth-reference-data-for-5to19-years/indicators/bmi-for-age	Nurse counselling + referral (severe thinness, thinness or obese only)		
Anaemia	Hb below WHO level for anaemia (Appendix 2)	Iron supplement and referral if severe anaemia		
Mental health	PHQ-9 score ≥10 or GAD-7 score ≥10 or PSC-17 score ≥15	Nurse counselling or Y-Check counselling		Referral
Suicide risk	Had thoughts that would be better off dead or of hurting yourself in some way on several days or more in the past two weeks OR had serious thoughts about ending your life at least once in the past month	Nurse counselling or Y-Check counselling	6	Referral
Vision	Distance vision <=6/9.5 in either eye	Referral		
Hearing	Fail HearScreen and no wax/foreign body or fail HearScreen following wax/foreign body removal	Ear examination with ear wax removal and repeat screening if required		Referral
Schistosomiasis	Tests positive	Treatment		
HIV	Tests positive	Nurse counselling or Y-Check counselling and referral. Referral may not be required if they report		

		previously diagnosed and in care.		
HIV questions	Reports HIV positive and not registered with a clinic that provides HIV care or not taking ART	Nurse counselling or Y-Check counselling		
STI test	Tests positive for CT, NG or TV (females only)	STI treatment on-the-spot (TV, females only) or following check-up (CT/NG)		
STI questions	Reports treatment for a STI in the past year OR reports symptoms of STIs	STI syndromic management		Referral
Contraception	Sexually active, self-reported not pregnant (females) or partner not pregnant (males), and not using effective contraception OR reported using/partner used emergency contraception at least once in the past 6 months	Nurse counselling		Contraception provision or referral
VMMC (not used in Ghana)	Male and uncircumcised	Referral		
Lower limb physical impairment	Best (longest) of two jump test measurements <80 cm	Nurse counselling or Y-Check counselling		Referral
Upper limb physical impairment	Best (highest) of grip test measurements in either arm less than value shown in Appendix 2	Nurse counselling or Y-Check counselling		Referral
Oral	Failed oral examination	Referral		
Blood pressure	Elevated second BP measurement	3rd BP measurement Nurse counselling If hypertensive crises then should refer		

Note: Nurse counselling was recorded as either ‘Nurse counselling’ or ‘Information provision’ in the actions recorded in the screening tool

Table 2: Definitions used for primary outcome

Term	Definition
Screen positive	Flagged for a condition during check-up visit, and the flag was not redefined as a 'false flag' by the study nurse (see note (1) below)
Receive appropriate on-the-spot care	During the screening visit the 'action taken' by the nurse was recorded. Potential actions included treatment, counselling, information provision and/or referral. Each condition has a pre-defined 'appropriate on-the-spot care' action or potential actions. Where multiple actions are required then all actions should have been taken e.g. for severe anemia the client should have been treated AND referred. If the participant is offered but refuses treatment/referral or refuses to discuss the issue then they are considered not to have received appropriate on-the-spot care. If the participant is already receiving care for their condition and does not require treatment or referral they will be considered to have received appropriate on-the-spot care.
Complete appropriate referral	Attended at least one referral visit. This will be measured by referral form retrieved from service provider indicating date of attendance at first referral visit.
By the time of the follow-up visit	By the time of follow-up data collection. In practice the follow-up visits will take place 4-6 months post-baseline.

2.1 Notes re primary outcome:

(1) We will consider a participant to have screened positive for a condition if the flag was orange or red OR the nurse recorded an action for the condition even if the app flag was green. Green flags were given an action when an issue was newly identified during discussions between the nurse and the adolescent.

(2) A priori we hypothesized that within one age group and sex, if 150 (30%) of 500 participants screen positive for at least one condition, and 75% of those who screen positive are correctly managed. The primary outcome findings will be interpreted in relation to this hypothesis.

(3) The timeframe for completing appropriate referral was specified as 4-months within the original protocol. For intervention implementation and logistical reasons not all participants in Zimbabwe had the opportunity to be referred within 4 months of their initial check-up visit (a detailed explanation of these reasons will accompany the presentation of the findings). The organization of referral appointments was accelerated prior to the planned 4-month follow-up visits and all participants had the opportunity to attend the referral appointment by the time of their follow-up visit. The 4-month follow-up visits in Zimbabwe took place over a period of 4-6 months post initial check-up visit. Hence, in Zimbabwe the time frame for the primary outcome has been defined as 'by the time of the follow-up visit' and will be 4-6 months post check-up to allow us to capture the uptake of referrals for all referred participants.

(4) The primary outcome will be greatly influenced by what happens with the more common conditions. The primary outcome will be interpreted alongside secondary outcomes which capture the proportion of participants screening positive for each condition who receive appropriate on-the-spot care or complete appropriate referral for that identified condition within the same time frame.

(5) Some conditions will be less accurately detected than others due to greater reporting biases or limitations in diagnostic tools. This will be considered in interpretation.

2.2 Sensitivity analysis

As sensitivity analysis of the primary outcome, the following changes will be made separately to the definition of essential terms:

Table 3: Changes to definition of terms for sensitivity analysis

Term	Definition
Screen positive	Flagged during data cleaning and the flag was not redefined as a 'false flag' by the study nurse. This includes flags that may not have been defined during data collection due to implementation errors, and excludes erroneous flags. (see note (1) below)
Receive appropriate on-the-spot care	(1) The outcome will be receipt of on-the-spot care only. If a flag required both on-the-spot care and referral the outcome will be based only on whether the client received on-the-spot care (2) The outcome will include those who refuse treatment/referral and/or those who refuse discussion on the topic as having received appropriate on-the-spot care
Complete appropriate referral	Referral form retrieved service provider indicating date of attendance at first referral visit, OR self-reported attendance at referral appointment
Within 4 months	Within exactly 4 months from baseline

(1) We will consider a participant to have screened positive for a condition if the recalculated flag is orange or red OR the nurse recorded an action for the condition even if the app flag was green. Green flags were given an action when an issue was newly identified during discussions between the nurse and the adolescent. Nurse notes will not be taken into account when deciding if a participant screened positive as there was inconsistent use of the notes field.

3 Secondary outcomes - implementation

Secondary outcomes for implementation which are related to this analytical plan are:

- Proportion of those who screen positive for individual conditions who receive appropriate on-the-spot care or complete appropriate referral by the time of the follow-up visit
- Yield of untreated conditions
- Improvements in previously diagnosed conditions

The following secondary outcomes are covered in the process evaluation plan:

- Intervention acceptability (satisfaction)
- Intervention adoption (uptake, utilization)
- Intervention appropriateness (perceived fit, perceived relevance, perceived usefulness, perceived value)
- Intervention feasibility (actual fit, practicability)
- Intervention fidelity (adherence, integrity, quality, diagnostic accuracy, youth-friendly health services quality assessment)

The following secondary outcomes are covered in the costing analysis plan:

- Cost of setting up and running the intervention
- Cost per adolescent with a newly diagnosed condition (overall and by condition)
- Cost per adolescent with a newly diagnosed condition who received appropriate on-the-spot care or who completed an appropriate referral within 4 months (overall and by condition)
- Short-term cost-effectiveness: cost per improvement in health or wellbeing and per DALY averted

3.1 Proportion of those who screen positive for individual conditions who receive appropriate on-the-spot care or complete appropriate referral by the time of the follow-up visit

This outcome is calculated as above for the primary outcome, separately for each condition listed in Table 1.

3.2 Yield of untreated conditions

In the original study protocol this outcome was defined as 'newly identified and unreferred', rather than ‘untreated’. However, in Zimbabwe it was not possible to collect reliable data as to whether a condition was newly identified or already known. Accordingly, this outcome has been redefined as ‘untreated conditions’ without attempting to establish whether the condition was previously identified. Yield will be calculated separately for each condition.

Numerator: number of individuals identified with a condition that is not currently being treated and requires counselling and/or treatment. The definition of ‘screen positive’ from the sensitivity analysis will be used (Table 3).

Denominator: number of individuals who were screened for the condition.

3.3 Improvements in previously-diagnosed conditions

Table 4: Improvement in previously diagnosed conditions

Condition	Sample/Denominator	Outcome	Analysis
STI symptoms	Has STI symptoms at baseline	Has STI symptoms at follow-up	Proportion non-symptomatic
STI test	Tests positive for at least 1 STI at baseline	Tests positive for at least 1 STI at follow-up	Proportion testing STI negative
Mental health	Scores > X* on screening tool at baseline	Scores > X on screening tool at follow-up	Proportion who screened negative
Suicide risk	Reports suicide ideation at baseline	Reports suicide ideation at follow-up	proportion not reporting suicidal ideation
Epilepsy	Uncontrolled seizures at baseline	Uncontrolled seizures at follow-up	proportion not reporting uncontrolled seizures
Vision	Visual impairment at baseline	Visual impairment at follow-up	Proportion with distance vision >6/12
Hearing	Hearing impairment at baseline	Hearing impairment at follow-up	Proportion who passed hearing screen

* The cutpoint 'X', is 10 for the Patient Health Questionnaire for depression (PHQ-9), 8 for the Generalised Anxiety Disorder questionnaire (GAD-7) and 15 for the Paediatric Symptoms Checklist (PSC-17).

4 Secondary outcomes - Client

The Y-Check intervention focuses on the following key IEC topics, and data collection focuses on knowledge and behaviours relating to these topics:

- Oral health
- Substance use and alcohol
- Mental health
- Sleep
- Physical activity
- Nutrition
- Sexual and reproductive health (Service 3 only)

Secondary effectiveness outcomes are:

4.1 Health-related knowledge

Health knowledge will be measured using an 8-item quiz. The proportion of participants who answer each item correctly will be reported, and the total health knowledge score will be calculated for each person. The quiz items are:

- Q401. Which of the following are effects of substance use? (Multiple answers, 2 true, 2 false)
- Q402. Which of the following are effects of substance use? (Multiple answers, 3 true, 1 false)
- Q403. How often should a person brush their teeth with fluoride daily? (Single answer)

- Q404. Which of the following are good ways to help yourself to stay well when you are feeling sad or anxious? (Multiple answers, 2 true, 3 false)
- Q405. How many hours should you sleep every day? (Single answer)
- Q406. How many hours in a day should you spend doing physical activity? (Single answer)
- Q407 How often should you eat fruit? (Single answer)
- Q408 Which of these is a good example of a healthy snack? (Single answer)

Participants will score 1 point for each correct answer, for a maximum of 8. Multiple choice answers must be entirely correct to score a point. The proportion of participants who score ≥6 points will be reported.

4.2 Intentions to adopt a healthy behaviour

The following variables about health intentions are measured in the evaluation questionnaire. Each one has the responses 'strong desire, 'some desire, 'no desire'.

- Q901. Desire/intention to avoid drugs (Service 2 and 3 only)
- Q902. Desire/intention to avoid drinking alcohol (Service 2 and 3 only)
- Q903. Desire/intention to be more active

For Service 1 the proportion of clients who report strong desire to be more active will be reported. For Service 1 this question was asked at 4 months only. For Services 2 and 3 the proportion of clients who report a strong desire towards all 3 items will be reported.

4.3 Agency to make decisions about health

Agency to make decisions about health will be measured among Service 2 and 3 participants using 2 items.

- Q801. Do you feel empowered to make your own health-related choices/decisions? (Absolutely not, sometimes, definitely) The proportion of clients who report 'definitely' will be reported.
- Q802, 'How easy would you say it is to make decisions to improve your health?' (Very difficult, fairly difficult, fairly easy). The proportion who report 'fairly easy' will be calculated.

4.4 Health-related risk and protective behaviours

The following information on health-related risk and protective behaviour is captured

Two items relating to **diet** will be collected

- Q301. Frequency of sweetened drink consumption in the past week (never, 1-3 times, 4-6 times, once a day, 2 or more times a day)
- Q302. Frequency of fruit consumption (never, 1-3 times, 4-6 times, once a day, 2 or more times a day)

These items will be recoded into binary outcomes, 'less than once a day' and 'once a day or more'.

Two items relating to **mental health** will be collected:

- Experience of mental health challenges in the past 4 months (yes/no)
- Whether participants used methods to support their mental health (talked to someone, got enough sleep, exercised, used a hotline, online help or counselling)

The proportion of clients experiencing mental health challenges who did not use any method to support their mental health will be reported.

- **Sleep.** Participants record the time they went to bed and the time they got up on the screening tool. This information will be used to calculate hours of sleep.
- **Physical activity** – how many days participants were physically active for more than 1 hour in the past 2 weeks (never, once, almost every day, or every day). The proportion who were active 'never' or 'once' will be calculated.
- **Substance and alcohol use** – measured using the 6-item CRAFFT screening tool, scored from 0-6 with 6 being highest risk
- **Smoking** – the proportion of participants who have smoked any of cigarettes, other tobacco products or vaping devices in the previous 30 days
- **Tooth brushing** – proportion of participants who cleaned their teeth less than twice a day in the past 30 days or did not use toothpaste
- **Sexual risk behaviour** (Service 3 only)
  The following information is collected on sexual behaviour:
  - Number of sexual partners in the past 6 months
  - Frequency of condom use in past 6 months (always, most of the time, some of the time, rarely, or never)
  - Current use of contraception (yes, no, or the participant/their partner is pregnant)
  - Method of contraception currently being used. Effective contraception will be defined as any of: male condom, female condom, oral contraceptive pill, implant, injection, IUD loop

- **HIV testing**
  - HIV status – whether the participant knows their HIV status. Knowledge of HIV status will be defined as participants whose reported HIV status (positive or negative) agrees with the result of their HIV test at baseline. Clients who self-report as HIV positive but whose test result is negative will be coded as HIV negative and as not knowing their status.
  - HIV linkage to care – if the participant is HIV positive, whether they have ever linked to care, ever taken ART, and are currently taking ART.

The definitions for risk and protective behaviour outcomes are presented in **Table 5**.

Note: For outcomes measured during the check-up visit and for which there was a flag, the nurse may have indicated that this was a 'false flag'. At follow-up behaviours were not flagged and so 'false flags' were not identified and recorded. We will, therefore, ignore the check-up visit 'false flag' information when comparing behaviours at check-up and follow-up.

Table 5 Risk and protective behaviours

	Baseline	Follow-up	Analysis
Diet (sugary drinks)	Proportion who drink sugary drinks at least once per day	Proportion who drink sugary drinks at least once per day	Difference in proportions
Diet (fruit)	Proportion who eat fruit less than once per day	Proportion who eat fruit less than once per day	Difference in proportions
Mental health coping strategies	Proportion of participants experiencing mental health challenges in the past 4 months who did not take any action to support their mental health	Proportion of participants experiencing mental health challenges in the past 4 months who did not take any action to support their mental health	Difference in proportions
Sleep	Proportion who report <8 hours of sleep	Proportion who report <8 hours of sleep	Difference in proportions
Physical activity	Proportion who were active on ≤1 day in the past 2 weeks	Proportion who were active on ≤1 day in the past 2 weeks	Difference in proportions
Drugs & alcohol	Score ≥2 on CRAFFT	Score ≥2 on CRAFFT	Difference in proportion reporting CRAFFT score ≥2
Smoking	Smoked any cigarettes in last 30 days	Smoked any cigarettes in last 30 days	Difference in proportion reporting smoking
Contraception (service 3)	Proportion of those sexually active and not pregnant who are using effective contraception[1]/condoms	Proportion of those sexually active and not pregnant who are using effective contraception/condoms	Difference in % reporting current use of contraceptives
Sexual activity (service 3)	Reports at least 1 sexual partner in the past 6 months	Reports at least 1 sexual partner in the past 6 months	Difference in proportion reporting at least 1 sexual partner in the past 6 months
Sexual risk (service 3)	More than 1 partner in the past 6 months	More than 1 partner in the past 6 months	Difference in proportion reporting >1 partner
Condom use (service 3)	Proportion of those who have had sex in the past 6 months who report using condoms sometimes, rarely or never	Proportion of those who have had sex in the past 6 months who report using condoms sometimes, rarely or never	Difference in proportion reporting condom use sometimes, rarely or never
Oral hygiene	Brushes teeth with flouride toothpaste at least once per day	Brushes teeth with flouride toothpaste at least once per day	Difference in % reporting at least minimal oral hygiene
HIV testing	Knows HIV status	Knows HIV status	Difference in proportion who

			know their HIV status
HIV linkage to care and adherence	Proportion of ALHIV who are linked to care and currently on ART	Proportion of ALHIV who are linked to care and currently on ART	Difference in proportion of ALHIV who are linked to care and currently on ART
VMMC (service 3)	uncircumcised	Uncircumcised at baseline and now circumcised	Proportion of males uncircumcised at baseline who are now circumcised

1 Effective contraception includes condoms, pill, implant, IUD/loop, injections. Not effective: rhythm, withdrawal, traditional herbs, emergency contraception

4.5 Engagement with health and other services in the past 4 months

All participants will be asked how often they have been sick in the past 4 months. Those who have been sick at least once will be asked the following questions about the last time they were sick:

- Whether they wanted to go to a clinic or hospital (Service 2 and 3 only)
- Whether they did go to a clinic or hospital
- If they did not go, the reasons why (could not afford it, family did not want to, too far away, went to a traditional healer, did not trust healthcare providers, didn't want to feel stigmatised, other)

All participants will be asked how often they have attended a clinic/hospital in the past 4 months, and the reasons why they attended (general healthcare, mental healthcare, family planning, STI treatment, HIV test, emergency, COVID-19 vaccination, other)

We will calculate the proportion of participants who attended a clinic or hospital in the past 4 months among those who were sick and wanted to go.

4.6 Self-esteem

Self-esteem will be measured with the 10-item Rosenberg self-esteem scale and reported as a continuous outcome on a scale from 10-40 with 40 being the highest. Median and IQR will be reported.

4.7 Quality of Life

Quality of life will be measured with the Child Health Utility instrument (CHU9D), a 9-item paediatric generic preference-based measure of health-related quality of life. Scores range from 0-40. Median and IQR will be reported.

4.8 Well-being

Participants will complete the item: "Overall, how satisfied are you with life as a whole these days?" (1-5 stars). The proportion of participants who answer 5 stars will be reported.

4.9 Clinical outcomes

In Zimbabwe clinical outcomes will be measured at baseline and 4 months. Haemoglobin will be measured using a fingerprick blood test. Anaemia will be categorised as a binary variable using WHO definitions. Height and weight will be measured and used to calculate BMI for age using WHO references.

Table 6: Clinical conditions

Condition	Baseline	Follow-up	Analysis
Thinness (<2SD) Severe thinness (<3SD)	proportion thin and severely thin	proportion thin and severely thin	Difference in proportion thin and severely thin
Obese (>2SD)	Proportion obese	Proportion obese	Difference in proportion obese
Anaemia	Proportion with anaemia	Proportion with anaemia	Difference in proportion who are anaemic
Severe anaemia	Proportion with severe anaemia	Proportion with severe anaemia	Difference in proportion who are severely anaemic

4.10 Educational outcomes

The main indicator of school attendance will be a self-report of the 'number of days of school missed in the last month'.

- Number of days of school missed in the last month
- How many days of school/work were missed due to ill health
- How many days of school/work were missed due to menstruation
- School results (bad, OK, good, excellent)
- Whether any of a list of symptoms (e.g. hearing problems, low energy, pain, anxiety) prevented the participants from a) doing their best in class, b) participating in school and extracurricular activities

Table 7: Educational outcomes

Outcome	Baseline	Follow-up	Analysis
Number of days of school/work missed in the last month	Proportion who missed >5 days	Proportion who missed >5 days	Difference in proportion
Number of days of school missed due to ill health in past month	Proportion who missed≥1 day	Proportion who missed≥1 day	Difference in proportion
Number of days of school	Proportion who missed≥1 day,	Proportion who missed≥1 day,	Difference in proportion

missed due to menstruation in past month	among girls who have started menstruation	among girls who have started menstruation	
School results	Proportion whose results are 'bad'	Proportion whose results are 'bad'	Difference in proportion
Impaired performance due to health	Proportion who reported a health condition prevented them doing their best in class	Proportion who reported a health condition prevented them doing their best in class	Difference in proportion
Reduced participation due to health	Proportion who reported a health condition prevented their participation in school activities	Proportion who reported a health condition prevented their participation in school activities	Difference in proportion

4.11 Client-centred outcomes

Client centred outcomes will be measured using the following item, rated on a scale of 1-5 (lowest to highest):

- How worthwhile do you think getting your health checked is?

The proportion of clients who give a score less than 5 will be reported.

5 Statistical analysis

5.1 Descriptive analysis

We will follow the STROBE guidelines for the reporting of cohort studies. A flowchart for each country showing the number of communities and schools and the number of participants per community and school at each contact point in the cohort study. The flow chart will include the proportion of the potentially eligible population in schools who participated in the study. The proportion of potentially eligible adolescents in community settings will be estimated using population census data. Characteristics of screened adolescents who did and did not join the study will be compared to assess for selection bias.

Individual socio-demographic characteristics of the study cohort will be described including gender, age, educational/employment status, religion and socio-economic status.

Descriptive analyses will be used to compare the community-level and school-level characteristics of the study communities and schools.

Survey implementation variables will be described at each timepoint (Table A4) and sociodemographic variables will be described at baseline only (Tables A5):

Quantitative programmatic data, including location and date of check-up visit, screening tests results, services delivered, and referrals made and completed, will be reported by age, sex, and location.

5.2 Missing data

The proportion of clients lost to follow-up will be reported. The proportion of missing values for individual conditions will also be reported as a percentage of those who were eligible to be assessed for the condition. Baseline information from clients lost to follow-up will be retained in analysis. Demographic characteristics of participants at baseline and 4 months will be compared, and imbalanced variables will be adjusted for in the models.

Loss to follow-up is expected to be higher in the community setting (Service 3) than the school setting (Services 1 and 2).

5.3 Analysis of primary and secondary outcomes

The primary analysis of all outcomes will be conducted separately by study city; Cape Coast, Chitungwiza and Mwanza. Where outcome definitions are sufficiently similar, secondary analysis will be conducted with the data from all three cities combined.

As the study is largely descriptive, we plan to use both continuous and binary outcomes where appropriate, to capture nuanced changes in outcome measures.

5.3.1 Binary outcomes measured at one timepoint

The primary outcome is a single proportion which will be presented with a 95% confidence interval for each of the 4 target groups: 10-14-year-old males, 10-14 year old females, 15-19 year old males, and 15-19 year old females (Table A6)

Secondary outcomes which are measured at a single time point, such as the proportion of clients with each condition who receive appropriate care, will be presented in a similar way to the primary outcome (Table A7).

For conditions where follow-up clinical outcomes are only measured among those who screened positive at baseline, the prevalence of the condition at 4 months among those who screened positive at baseline will be calculated with a 95% confidence interval.

Additional analysis will present findings for the older adolescents according to location (secondary school, community hub).

5.3.2 Binary outcomes with repeated measures

For outcomes which are measured at two time-points, a before-after analysis will be conducted comparing differences in measures between the two time-points. The initial check-up visit (baseline) will give the prevalence of the outcome e.g. untreated chronic conditions, which will represent the counterfactual. The proportion of the outcome e.g. untreated chronic conditions at the 4-month follow-up visit will be formally compared to this counterfactual to estimate the effectiveness of the intervention in improving the outcomes. The percentage point difference in prevalence of each outcome will be calculated with 95% confidence intervals. Prevalence

ratios and 95% confidence intervals will be estimated using a mixed effects population-averaged generalised linear model with Bernoulli distribution and logit link function, adjusting for school/community as a fixed effect, using the *xtgee* command in Stata. The Wald test will be used to test for statistical significance. The unit of analysis will be the individual.

5.3.3 Continuous outcomes with repeated measures

For certain conditions, we will also compare the severity of the clinical condition at 4 months and at baseline, modelling severity as a continuous outcome. Variables analysed in this way include mental health score. For continuous outcomes, we will use a mixed effects generalised linear model with Normal distribution, adjusting for individual-level clustering as a random effect and school/community as a fixed effect. As before the Wald test will be used to test for statistical significance.

5.4 Determinants of primary and secondary outcomes

Health service and client determinants of correct management of conditions at 4 months will be analyzed using multivariable models. Potential risk factors for non-management will be added to the model to determine their association with the outcome. The potential factors and their hypothesized relationship with non-management will be described in detail in a separate document prior to the conduct of the analysis.

5.5 Effect modification

We will assess modification of intervention effect by a-priori defined modifiers (gender (male, female), service (1- primary, 2- secondary, 3- community) We will fit an interaction term with ‘visit’ in the models and test for heterogeneity of intervention effects.

5.6 Additional planned analyses

Time to referral

The time between opportunity to attend referral (this will be the check-up visit itself for some conditions and date of invitation to referral from the Y-Check team for other conditions) and the date of attendance at first referral appointment will be calculated. Time to referral will be described as a continuous variable (number of days).The factors associated with time to referral will be assessed.

Anthropometry, physical activity and nutrition

An additional analysis will look at the association between behavioural intentions, behaviors and the outcome BMI. We will explore the correlation between BMI, MUAC and waist circumference.

Oral health

An additional analysis will describe oral health (prevalence of caries, gum problems, oral hygiene behaviours), and look at factors associated with poor oral health, for example, socioeconomic status, substance use etc.

Blood pressure

An additional analysis will describe systolic and diastolic blood pressure, and patterns of blood pressure across the different measurements. Factors associated with high blood pressure will be explored.

Patterns of risk and protective behaviours

Risk and protective behaviours will be described, and patterns of risk and/or protective behaviours will be explored. If clusters of risk are identified, we will explore factors associated with higher risk clusters.

Patterns of morbidity and multi-morbidity

Patterns of morbidity will be described. If multimorbidity is present then we will explore factors associated with different patterns of multimorbidity.

Analytical plan for Zimbabwe Version 1.4 is the final version following a revision to the Version 1.3 - 05 Oct 2024, whereby we considered a participant to have screened positive for a condition if the nurse recorded an action for the condition even if the app flag was green.

6 Appendices

Appendix 1: Implementation data at 4 months follow-up

Among those who screened positive for specific conditions at baseline, additional implementation data will be collected at 4 months to determine whether the client received appropriate care and identify any barriers to care. The additional questions are listed below.

<u>For substance use, mental health, suicide risk:</u>

- Did you get any counselling from the Y-Check counsellor about your...? Were the counselling sessions at Y-Check useful in helping you to reduce….?
- Did you attend a counselling session at school, Friendship Bench or the clinic about your ….?
    - Were the counselling sessions useful in helping you to ….?
- Why did you not visit the school, Friendship Bench or the clinic?

<u>For schistosomiasis, STI, contraceptives, iron supplements:</u>

- Did you receive treatment/contraceptives when you attended Y-Check?
- Are you still using the treatment/contraceptives received from Y-Check?
    - If not, why not?
- Did your (STI) symptoms resolve after taking the medication?

<u>For epilepsy, vision, hearing, nutrition, HIV, VMMC, anaemia, dentist, physical impairment:</u>

- Did you visit a service provider for your …. After Y-Check?
    - How many times did you visit the service provider?
    - Did the service provider give you medication/glasses/hearing aid/plumpynut/dental treatment?
    - Are you still taking the medication/wearing the glasses/using the hearing aid?
- (If referred for VMMC) Were you circumcised?
- (If referred for HIV) Have you registered with a clinic or any centre that provides HIV care? Did you visit a doctor or clinic for HIV medicine after your Y-Check check-up?
    - If not, why not?
- Were you given HIV treatment (ART)?
- In the past month, how often did you take your medicine? (never, rarely, sometimes, always)
- Why did you not take your medicine?
- Why did you not visit the doctor/clinic/hospital/VMMC centre?
- Are you feeling better now that your epilepsy/weight is being controlled/is better/is healthier?
- (if referred for epilepsy) Has the frequency of your seizures increased, reduced, or stayed the same since you started taking the medicine?
- (if referred for weight) Do you feel your weight has changed since you came to Y-Check?
- (If referred for vision) Do you feel that your vision is better since you got the glasses?
- (If referred for hearing) Do you feel that your hearing is better since you got the hearing aids?

<u>For oral hygiene:</u>

- Did you use the toothbrush/toothpaste received from Y-Check?
    - If not, why not?

<u>For menstrual hygiene:</u>

- During your most recent period, did you use the reusable pads provided by Y-Check?
    - If not, why not?

Table A1: measurement of conditions and issues at 4 months follow-up

Flag	Include in primary outcome?	Measure at 4 months?	Additional questions if screened positive at baseline	Opt-out service provision at 4 months	Opt-in service provision at 4 months
Home	Yes	No	N/A	No	Counselling
School/ work	Yes	No	N/A	No	Counselling
Body	Yes	No	N/A	No	Counselling
Meals	Yes	No	N/A	No	Counselling
Friends	Yes	No	N/A	No	counselling
Sleep	Yes	Yes (risk behaviour)	N/A	No	Counselling
Exercise	Yes	Yes (risk behaviour)	N/A	No	Counselling
Drugs/ alcohol	Yes	Yes (risk behaviour)	Those who screen positive (including false flags) at baseline are asked questions about linkage to care and/or experience of counselling	If flagged at baseline (including false flags) then can be counselled or referred again.	Counselling
Smoking	Yes	Yes (risk behaviour)	N/A	No	Counselling
Sexual risk	Yes	Yes (risk/protective behaviour)	N/A	No	Counselling
Contraception	Yes	Yes (risk/protective behaviour)	Those who received contraceptives were asked about their experience of use of Y-Check contraceptives	No	Provision of contraceptives
STI symptoms	Yes	Yes At baseline participants self-reported symptoms, at	Those who received syndromic management for STIs at baseline are asked about receipt of Y-Check medication, symptoms resolution, partner notification	Treatment if symptomatic + partner notification and partner treatment. Syndromic management offered as **opt-out** service as it would be hard to offer as opt-in service ie	No

Flag	Include in primary outcome?	Measure at 4 months?	Additional questions if screened positive at baseline	Opt-out service provision at 4 months	Opt-in service provision at 4 months
		follow-up nurse asked questions.		would have to ask about specific symptoms to know if they might need the service.	
STI test	Yes	Those who screened positive at baseline for a particular STI are asked to provide the relevant sample e.g. vaginal swab for TV positive at baseline and/or urine sample for CT/NG positive at baseline. Urine samples are tested for CT and NG regardless of baseline diagnosis.	Those who tested positive for CT/NG or TV are asked about partner notification.	Treatment if test positive for any STI + partner notification and partner treatment.	No
PSC17 (mental health)	Yes	Only if screened positive (including false flags) at baseline	Those who were flagged (including false flags) at baseline are asked about linkage to care and/or experience of counselling	Can be counselled or referred again if still score highly.	Counselling
PHQ-9 (depression)	Yes	Only if screened positive (including false flags) at baseline	Those who were flagged (including false flags) at baseline are asked about linkage to care and/or experience of counselling	Can be counselled or referred again if still score highly.	Counselling
GAD-7 (anxiety)	Yes	Only if screened positive (including	Those who were flagged (including false flags) at baseline are asked	Can be counselled or referred again if still score highly.	Counselling

Flag	Include in primary outcome?	Measure at 4 months?	Additional questions if screened positive at baseline	Opt-out service provision at 4 months	Opt-in service provision at 4 months
		false flags) at baseline	about linkage to care and/or experience of counselling		
Suicide risk	Yes	Only if screened positive (including false flags) at baseline	Those who were flagged (including false flags) at baseline are asked about linkage to care and/or experience of counselling	Can be counselled or referred again if still score highly.	Counselling
Oral hygiene	Yes	Yes (risk/protective behaviour)	Everyone is asked about use of Y-Check toothbrush and toothpaste.	Everyone gets another toothbrush and toothpaste	None
Epilepsy	Yes	Only if screened positive at baseline (Frequency of seizures and medication adherence)	Those who screened positive at baseline are asked about linkage to care, and medication adherence	Those who report non-adherence or increased frequency of seizures are provided nurse counselling +/- referral.	None
HIV Q (questions on linkage to care and adherence)	Yes	Only if reported HIV+ but not linked to care or non-adherent at baseline	Those who reported HIV+ but not linked to care or non-adherent at baseline asked about linkage to care and adherence	If non-adherent receive counselling and if not linked to care then counselled and referred again	None
HIV_T (test)	Yes	No	Those who newly screened HIV positive at baseline are asked questions on linkage to care and adherence		HIV testing, counselling and referral
VMMC	Yes	No	Those who newly screened HIV positive at baseline are asked questions on linkage to care and adherence		VMMC information and referral if not previously referred
Blood pressure	Yes	Yes (Service 2 & 3)	NA	Flag + 3rd BP measurement and refer if hypertensive crises or	None

Flag	Include in primary outcome?	Measure at 4 months?	Additional questions if screened positive at baseline	Opt-out service provision at 4 months	Opt-in service provision at 4 months
				gestational hypertension (if self-reported pregnancy or if pregnancy test done as requested hormonal contraception)	
BMI	Yes	Yes	If were underweight or obese at baseline then asked about referral service attendance and if underweight also asked about use of plumpynut	Referral if underweight and did not attend referral previously or newly underweight. Counselling if overweight or obese.	None
Jump test	Yes	Only if screened positive at baseline (improvement of condition)	If screened positive at baseline, then asked questions about linkage to care and experience of physiotherapy.	If screened positive at baseline, then asked questions about linkage to care and experience of physiotherapy.	None
Grip strength	Yes	Only if screened positive at baseline (improvement of condition)	If screened positive at baseline, then asked questions about linkage to care and experience of physiotherapy.	If screened positive at baseline, then asked questions about linkage to care and experience of physiotherapy.	None
Fine motor skills	No	N/A	N/A	deteriorated/A	None
Vision	Yes	Only if screened positive at baseline	If screened positive at baseline, then asked about linkage to care and receipt & use of glasses	Referral if fail PEEK again with spectacles. If spectacles are broken then return to Council to the Blind to find out cost/consider payment.	None
Anaemia	Yes	Yes	If screened positive at baseline then asked about iron supplement use. If severely anaemic at baseline then asked about linkage to care.	Provision of iron supplements (3 months supply for those positive at baseline and still anaemic, 6 months supply for newly positive). Referral if severely	None

Flag	Include in primary outcome?	Measure at 4 months?	Additional questions if screened positive at baseline	Opt-out service provision at 4 months	Opt-in service provision at 4 months
				anaemic regardless of whether referred previously.	
Hearing	Yes	Only if screened positive at baseline	If screened positive at baseline asked about attendance at referral, hearing aid use	If screened positive at baseline asked about attendance at referral, hearing aid use	None
Oral	Yes	Only if screened positive at baseline (improvement of teeth and gum health)	Linkage to care and treatment	Flag, nurse review +/- referral if report condition has deteriorated	None
Schisto-somiasis	Yes	No	No	N/A	None

Appendix 2: definitions of grip strength and anaemia

Table A2 Grip strength

	Dominant arm		Non-dominant arm	
Age	**Males** (kgs)	**Females** (kgs)	**Males** (kgs)	**Females** (kgs)
10	10.8	10.4	9.1	9.4
11	12.9	12.5	11.2	11.2
12	15.8	14.6	14.1	13.0
13	19.1	16.5	17.9	14.6
14	22.7	18.0	22.1	15.8
15	26.0	18.9	26.1	16.7
16	28.7	19.3	29.2	17.3
17	30.7	19.3	31.2	17.8
18	34.1	19.3	34.1	18.2
19	35.7	19.3	35.7	19.2

Table A3 Anaemia

Adolescent's Age	Normal	Mild-Moderate anaemia	Severe anaemia
≤11 years	Female: Hb ≥11.5g/dL	Female: Hb <11.5g/dL	Female: Hb <8.0g/dL
	Male: Hb ≥11.5g/dL	Male: Hb <11.5g/dL	Male: Hb <8.0g/dL
12-14 years	Female: Hb ≥12.0g/dL	Female: Hb <12.0g/dL	Female: Hb <8.0g/dL
	Male: Hb ≥12.0g/dL	Male: Hb <12.0g/dL	Male: Hb <8.0g/dL
≥15 years	Female: Hb ≥12.0g/dL	Female: Hb <12.0g/dL	Female: Hb <8.0g/dL
	Male: Hb ≥13.0g/dL	Male: Hb <13.0g/dL	Male: Hb <8.0g/dL
Pregnant Females (≥15 years)	Hb ≥11.0g/dL	Hb <11.0g/dL	Hb <8.0g/dL

Appendix 3 Dummy tables

Table A4 Implementation variables

Variable	Categories	Enrolment, n (%)	Follow-up, n (%)
Date of visit	Median (range)		
Current school grade	Grade 5		
	Grade 6		
	Grade 7		
	Form 1		
	Form 2		
	Form 3		
	Form 4		
	Lower 5		

	Upper 6		
	Not in school		
Highest school grade completed (S3 only)	Grade 4		
	Grade 5		
	Grade 6		
	Grade 7		
	Form 1		
	Form 2		
	Form 3		
	Form 4		
	Lower 5		
	Upper 6		
Employment status (S2 and S3 only)	Working for someone		
	Self-employed		
	Unemployed and seeking work		
	Unemployed and not seeking work		
	Working for parents		
	Do not want to answer		
Language used	Shona		
	English		
Level of assistance	No assistance		
	Little assistance		
	Great assistance		
	Did not complete		
Reason why friends would be dishonest in filling in questionnaire (multiple selection)	Scared to get into trouble		
	Some questions are too personal		
	Worried my teachers or parents will find out what I have answered and be angry with me		
	Ashamed to respond truthfully		
	Other (specify)		

Table A5 Sociodemographic variables

		Enrolment, n (%)
Age in years	10	
	11	
	12	
	13	
	14	
	15	
	16	
	17	
	18	
	19	
Gender	Male	
	Female	
Location	Chaminuka (S1)	
	Shingai (S1)	
	St Mary's (S1)	

	Farai (S1)	
	Zengeza 2 (S2)	
	Seke 3 (S2)	
	Zengeza Hub (S3)	
	Seke Hub (S3)	
Who the participant lives with (multiple selection)	Mother/father	
	Sister/brother	
	Grandparent	
	Aunt/uncle	
	Step parent	
	Boyfriend/girlfriend	
	Husband/wife	
	Alone	
Guardian working status	Working for someone	
	Self-employed	
	Unemployed and seeking work	
	Unemployed and not seeking work	
	Don't know	
	Do not want to answer	
Asset ownership (multiple selection)	Fridge	
	Bicycle	
	Car	
	Motorbike	
	Boat	
	Cart	
	TV	
	Radio	
	Microwave	
	Mobile phone	
	Computer	
Current school	Chaminuka	
	Shingai	
	St Mary's	
	Farai	
	Zengeza 2	
	Seke 3	
	Zengeza 1	
	Zengeza 3	
	Zengeza 4	
	Seke 1	
	Seke 2	
	Seke 4	
	Seke 6	
	Harentals College	
	Young Africa High School	
	Young Africa Academy	
	Young Africa Skills Centre	
	Lighthouse	
	Other	
Religion	Muslim	
	Christian	
	African traditional	

	None	
	Don't know	
	Other	

Table A6: Primary outcome analysis dummy table

Age and sex	N	Proportion of participants screening positive for at least one condition who receive appropriate on-the-spot care or complete appropriate referral for all identified conditions by 4-month follow-up (95% CI)
Males age 10-14		
Females age 10-14		
Males age 15-19		
Females age 15-19		

Table A7: Secondary outcome analysis dummy table

Condition	Proportion of participants screening positive for the condition who receive appropriate on-the-spot care or complete appropriate referral for all identified conditions by 4-month follow-up (95% CI)			
	Males age 10-14	Females age 10-14	Males age 15-19	Females age 15-19
Home				
School/work				
Body				
Meals				
Friends				
Oral hygiene				
Sleep				
Exercise				
Drugs/alcohol				
Smoking				
Sexual risk				
Epilepsy				
Thinness				
Obesity				
Anaemia				
Mental health				
Suicide risk				
Vision				
Hearing				
Schistosomiasis				
Oral				
HIV				
STI symptoms				
STI test				
Contraception				

VMMC				
BP (hypertensive crises)				
Physical impairment				